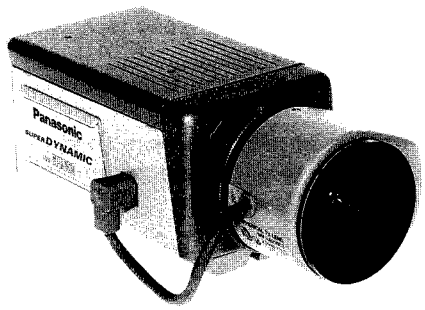
ORDER NO. AVS9710062C8

Service Manual

Coluor CCTV Cameras

WV-CP450/WV-CP454
WV-CP650/WV-CP654



(Lens: Option)

SPECIFICATIONS

Pick-up Device:	752 (H) x 582 (V) pixels, Interline Transfer CCD	
Scanning Area:	4.9 (H) x 3.7 (V) mm (Equivalent to scanning area of 1/3" pick-up tube)	
Scanning:	625 lines / 50 fields / 25 frames	
Horizontal:	15.625 KHz	
Vertical:	50.00 Hz	
Synchronization:	Internal, Line-locked, External (VS/VBS) or Multiplexed Vertical Drive (VD2) Selectable	
Video Output:	1.0 V[p-p] PAL composite 75 Ω / BNC connector	
Horizontal Resolution:	480 lines	
Signal-to-Noise Ratio:	50 dB (AGC OFF, weight ON)	
Dynamic Range:	40 dB	
Minimum Illumination:	0.9 lx (0.09 footcandle) at F0.75 [Equivalent to 3 lx (0.3 footcandle) at F1.4]	
Gain Control:	Selectable AGC ON or OFF (SET UP MENU)	
White Balance:	Selectable ATW or AWC (SET UP MENU)	
Aperture:	Set Variable (SET UP MENU)	
Electronic Light Control:	Equivalent to continuous variable shutter speed between 1/50 second and 1/10 000 second	
Back Light Compensation:	Selectable Preset On or Off (SET UP MENU)	
Electronic Shutter Speed:	Selectable 1/50 (OFF), 1/120, 1/250, 1/500, 1/1 000, 1/2 000, 1/4 000, 1/10 000 second	
Lens Mount:	Selectable C-mount or CS-mount	
ALC Lens:	Selectable DC or Video	
Ambient Operating Temperature:	-10°C - +50°C (14°F - 122°F)	
Ambient Operating Humidity:	Less than 90%	
Power Source and Power Consumption:	WV-CP450:	220 - 240V AC 50 Hz, 5.3W
	WV-CP454:	24V AC 50 Hz, 5.2W 12V DC, 540 mA
	WV-CP650:	220-240V AC 50 Hz, 5.5W
	WV-CP654:	24V AC 50 Hz, 5.2W 12V DC, 540 mA
Dimensions (without lens):	67 (W) x 55 (H) x 123 (D) mm [2-5/8" (W) x 2-3/16" (H) x 4-13/16" (D)]	
Weights (without lens):	WV-CP450:	0.405 kg (0.89 lbs.) (without power cord)
	WV-CP454:	0.405 kg (0.89 lbs.)
	WV-CP650:	0.41kg (0.9 lbs.) (without power cord)
	WV-CP654:	0.41kg (0.9 lbs.)

Weights and dimensions indicated are approximate.
Specifications are subject to change without notice.

Panasonic

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STANDARD ACCESSORIES

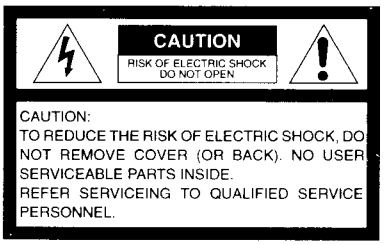
Body Cap .....1 pc.
ALC Lens Connector .....1 pc.
AC Power Cord (for only WV-CP450 and WV-CP650)...1 pc.

OPTIONAL ACCESSORIES

Lenses : WV-LA2R8C3B, WV-LA4R5C3B, WV-LA9C3B, WV-LA210C3, WV-LA408C3, WV-LA908C3
WV-LZ61/10, WV-LZ62/2, WV-LF4R5C3A, WV-LF9C3A

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.



This symbol warns the user that uninsuland voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this unit.

This symbol alerts the user that impotant literature concerning the operation and maintenance of this has been included. Therefore, it should be read carefully in order to avoid any problems.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are indicated by the ⚠ mark on the schematic diagram and the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards.
Do not modify the original design without permission of manufacture.

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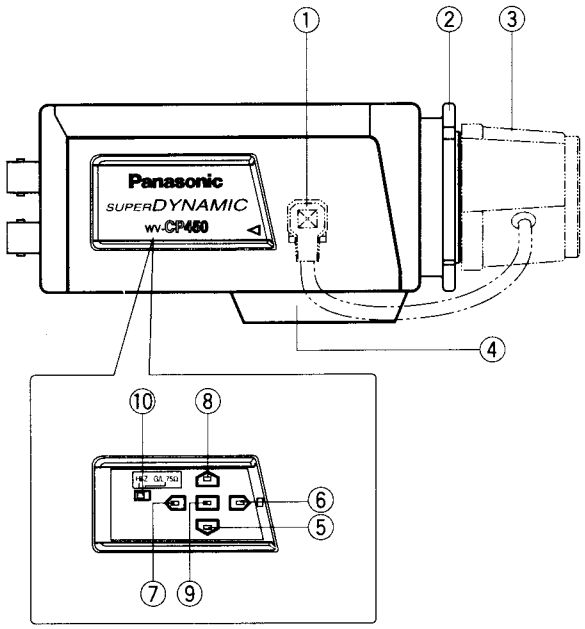
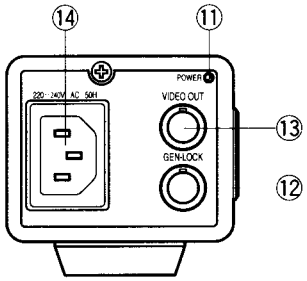
MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS

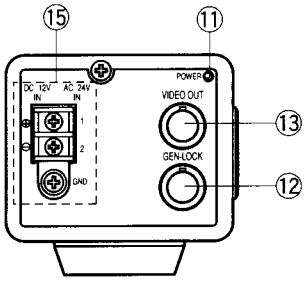


Slide the panel to the left until it locks.

<WV-CP450>



<WV-CP454>



① **Auto Iris Lens Connector**
This connector is used to connect with the auto iris lens by a 4-pin male connector that is supplied as a standard accessory.

② **Back Focal Adjusting Ring**
This ring is used to adjust the back focal length or picture focus. Rotate this ring clockwise for a C-mount lens or counter-clockwise for a CS-mount lens.

③ **Lens (Option)**

④ **Camera Mounting Screw Hole**
This hole is used to mount the camera onto a mounting bracket.

⑤ **Down Button ( )**
This button is used to move the cursor downward. It is also used to select items in the CAM SET UP menu.

⑥ **Right Button ( )**
This button is used to move the cursor to the right. It is also selects the mode and can be used to adjust some levels.

⑦ **Left Button ( )**
This button is used to move the cursor to the left. It also selects the mode and can be used to adjust some levels.

⑧ **Up Button ( )**
This button is used to move the cursor upward. It is also used to select items in the CAM SET UP menu.

⑨ **Set Button ( )**
This button is used to activate an item selected in the CAM SET UP menu.

⑩ **Gen-lock Termination Switch (Hi-Z, G/L 75Ω)**
Set this switch to Hi-Z when a gen-lock video input signal is looped through. In all other cases, set this switch to 75Ω.

⑪ **Power indicator**
This indicator lights up when the power of this camera is on.

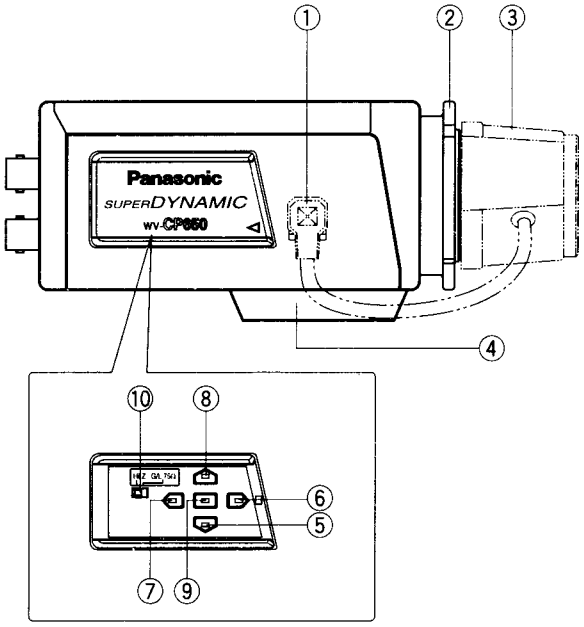
⑫ **Gen-lock Input Connector (GEN-LOCK)**
This connector is used to connect an external system for synchronization.

⑬ **Video Output Connector (VIDEO OUT)**
This connector is used to connect with the VIDEO IN connector of the monitor.

⑭ **Power Cord Socket**
This socket is used to connect the power cord (supplied as a standard accessory).

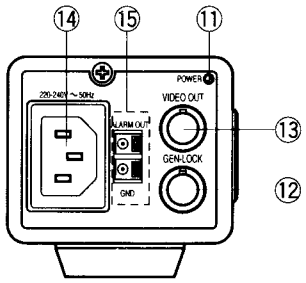
⑮ **AC/DC Compatible Input Terminal (DC 12V IN/AC 24V IN)**
This terminal is for connecting the 12 V DC or 24 V AC power supply cord.

Caution:
Connect to 12V DC (10.5V-16V) or 24V AC (19.5V-28V) class 2 power supply only. Make sure to connect the grounding lead to the GND terminal when the power is supplied from a 24V AC power source.



Slide the panel to the left until it locks.

<WV-CP650>



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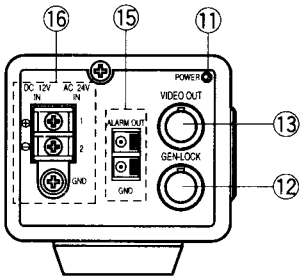

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This button is used to move the cursor upward. It is also used to select items in the CAM SET UP menu.

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This button is used to activate an item selected in the CAM SET UP menu.

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This connector is used to connect an external system for synchronization.

⑬ **Video Output Connector (VIDEO OUT)**
This connector is used to connect with the VIDEO IN connector of the monitor.

⑭ **Power Cord Socket**
This socket is used to connect the power cord (supplied as a standard accessory).

⑮ **Alarm Output Terminal (ALARM OUT/GND)**
This terminal is used to connect to the ALARM INPUT connector (terminal) of an external equipment. When this camera detects motion, the alarm output signal is supplied to the connected external equipment.

⑯ **AC/DC Compatible Input Terminal (DC 12V IN/AC 24V IN)**
This terminal is for connecting the 12 V DC or 24 V AC power supply cord.

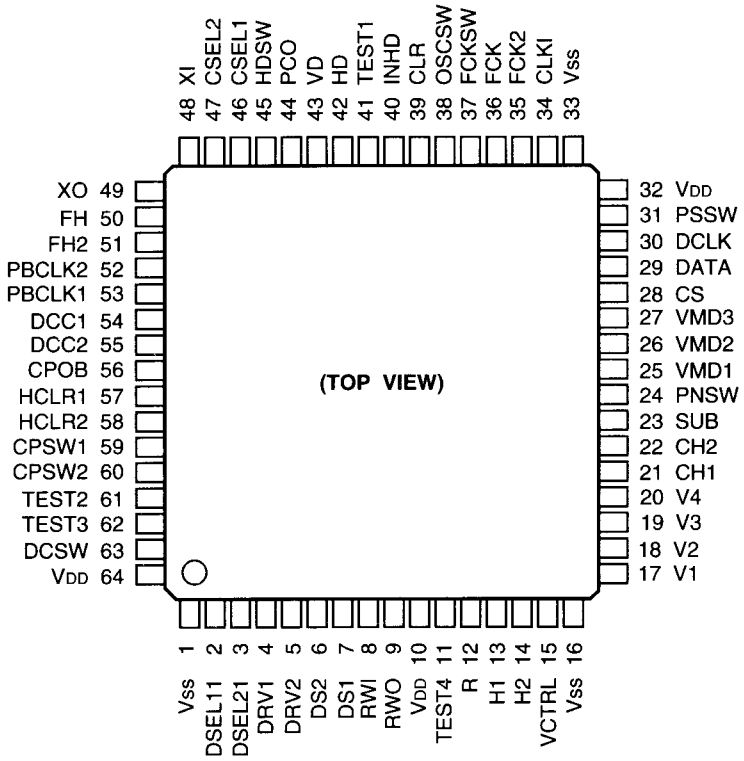
Caution:
Connect to 12V DC (10.5V-16V) or 24V AC (19.5V-28V) class 2 power supply only. Make sure to connect the grounding lead to the GND terminal when the power is supplied from a 24V AC power source.

CIRCUIT DESCRIPTION

IC Description

1. MCM Board

1.1. IC5 on the MCM Board is using the CCD Drive Pulse Generator IC MN5278C.
Description of this IC is as follows:

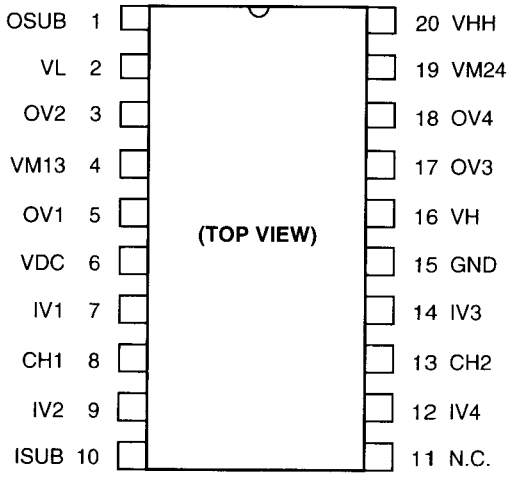


Pin	Name	I/O	Description
1	Vss	–	Ground
2	DSELL11	I	DRV Pulse phase switching signal input terminal.
3	DSELL21	I	
4	DRV1	I	Drive Pulse input terminal
5	DRV2	I	
6	DS2	O	Pulse output terminals for CDS.
7	DS1	O	
8	RWI	I	R Transfer Pulse Width adjust input terminal.
9	RWO	O	R Transfer Pulse Width adjust output terminal.
10	VDD	–	Power supply terminal.
11	TEST4	–	Test terminal.
12	R	O	R Transfer Pulse output terminal.
13	H1	O	H1 Transfer Pulse output terminal.
14	H2	O	H2 Transfer Pulse output terminal.
15	VCTRL	–	Non connection.
16	Vss	–	Ground terminal.
17	V1	O	V1 Transfer Pulse output terminal.

Pin	Name	I/O	Description
18	V2	O	V2 Transfer Pulse output terminal.
19	V3	O	V3 Transfer Pulse output terminal.
20	V4	O	V4 Transfer Pulse output terminal.
21	CH1	O	Charge Pulse for V1 output terminal.
22	CH2	O	Charge Puise for V2 output terminal.
23	SUB	O	SUB signal output terminal.
24	PNSW	I	TV System switching signal input terminal.(L: NTSC; H: PAL)
25	VMD1	I	Electronic Shutter switching signal input terminal.
26	VMD2	I	
27	VMD3	I	
28	CS	I	Chip Select signal input terminal for Serial Data.
29	DATA	I	Serial Data intput termina.
30	DCLK	I	Serial Clock input termina.
31	PSSW	–	Non connection.
32	VDD	–	Power supply terminal.

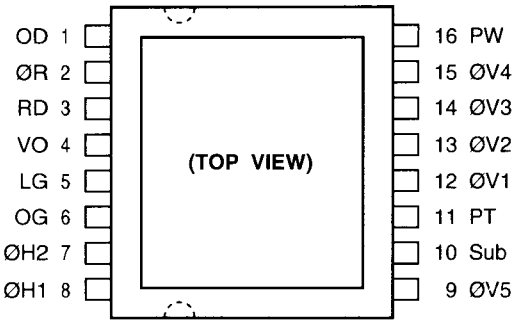
Pin	Name	I/O	Description
33	Vss	–	Ground terminal.
34	CLKI	I	Clock Pulse intput terminal.
35	FCK2	O	Clock Pulse output terminals.
36	FCK	O	
37	FCKSW	I	Clock Pulse switching signal input terminal.
38	OSCSW	I	OSC switching signal input terminal.
39	CLR	I	All clear signal input terminal. L: Clear; H: Active
40	INHD	–	Non connection.
41	TEST1	–	Test terminal.
42	HD	I	Horizontal Drive Pulse input terminal.
43	VD	I	Vertical Drive Pulse input terminal.
44	PCO	O	Phase Comparator output terminal.
45	HDSW	I	HD Switching signal input terminal. H: Internal; L: External
46	CSEL1	I	Clok Pulse phase switching signal input terminal.
47	CSEL2	I	
48	XI	I	2fck OSC input terminal.
49	XO	O	2fck OSC output terminal.
50	FH	O	FH Pulse output terminal.
51	FH2	O	FH/2 Pulse output terminal.
52	PBCLK2	O	Pre Blanking Pulse output terminal. Start: Rising edge of HCLR signal.
53	PBCLK1	O	Pre Blanking Pulse output terminal. Start: Rising edge of HD signal.
54	DCC1	–	Non connection
55	DCC2	–	
56	CPOB	O	OB Clamp Pulse output terminal.
57	HCLR1	–	Non connection.
58	HCLR2	O	øH Clear Pulse output terminal.
59	CPSW1	I	CPOB Phase Switching signal input terminals.
60	CPSW2	I	
61	TEST2	–	Test terminal
62	TEST3	–	
63	DCSW	I	DCC Phase Switching signal input terminal.
64	VDD	–	Power supply terminal.

1.2. IC3 and 6 on the MCM Board are using the Pulse Drive IC MN3112C.
Description of this IC is as follows:



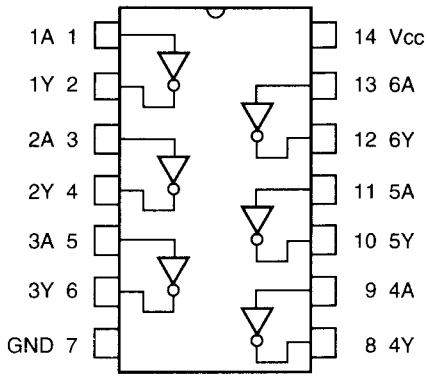
Pin	Name	I/O	Description
1	OSUB	O	VSUB signal output terminal.
2	VL	–	VL voltage supply terminal.
3	OV2	O	Vertical Pulse 2 output terminal.
4	VM13	I	VM13 voltage supply terminal.
5	OV1	O	Vertical Pulse 1 output terminal.
6	VDC	–	Power supply.
7	IV1	I	Vertical Pulse 1 input terminal.
8	CH1	I	Horizontal Pulse 1 input terminal.
9	IV2	I	Vertical Pulse 2 input terminal.
10	ISUB	I	VSUB signal input terminal.
11	N.C.	–	Non Connection.
12	IV4	I	Vertical Pulse 4 input terminal.
13	CH2	I	Horizontal Pulse 2 input terminal.
14	IV3	I	Vertical Pulse 3 input terminal.
15	GND	–	Ground terminal.
16	VH	–	VH voltage supply terminal.
17	OV3	O	Vertical Pulse 3 output terminal.
18	OV4	O	Vertical Pulse 4 output terminal.
19	VM24	–	VM24 voltage supply terminal.
20	VHH	–	VHH voltage supply terminal.

1.3. IC1 on the MCM Board is using the CCD Imaging Sensor IC MN37281FE.
Description of this IC is as follows:



Pin	Name	I/O	Description
1	OD	–	Power supply terminal for Drain of Output Amplifier.
2	ØR	I	Reset Gate Clock Pulse input terminal.
3	RD	–	Power supply terminal for Drain of Reset Amplifier.
4	VO	O	Video Signal outpur terminal.
5	LG	–	Gate Bias supply terminal for Drain of Reset Amplifier.
6	OG	–	Gate Bias supply terminal for Output Amplifier.
7	ØH2	I	Horizontal Shift Register Transfer Clock Pulse input terminal.
8	ØH1	I	Horizontal Shift Register Transfer Clock Pulse input terminal.
9	ØV5	I	Vertical Shift Register Transfer Clock Pulse input terminal.
10	Sub	–	Board (Overflow Drain).
11	PT	I	Bias supply terminal for protection transistor.
12	ØV1	I	Vertical Shift Register Clock Pulse input terminal.
13	ØV2	I	Vertical Shift Register Clock Pulse input terminal.
14	ØV3	I	Vertical Shift Register Clock Pulse input terminal.
15	ØV4	I	Vertical Shift Register Clock Pulse input terminal.
16	PW	–	Ground terminal.

1.4. IC2 on the MCM Board is using the Hex Inverters IC YWSN74LVC04Y.
Description of this IC is as follows:



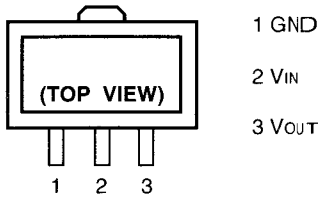
(TOP VIEW)

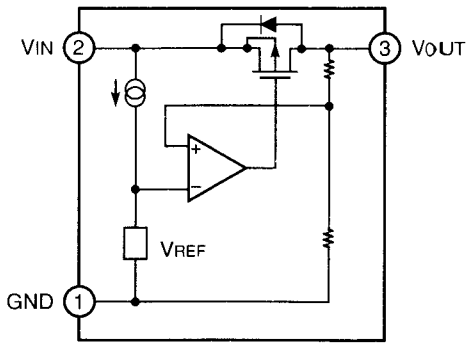
Truth Table

INPUT A	OUTPUT Y
L	H
H	L

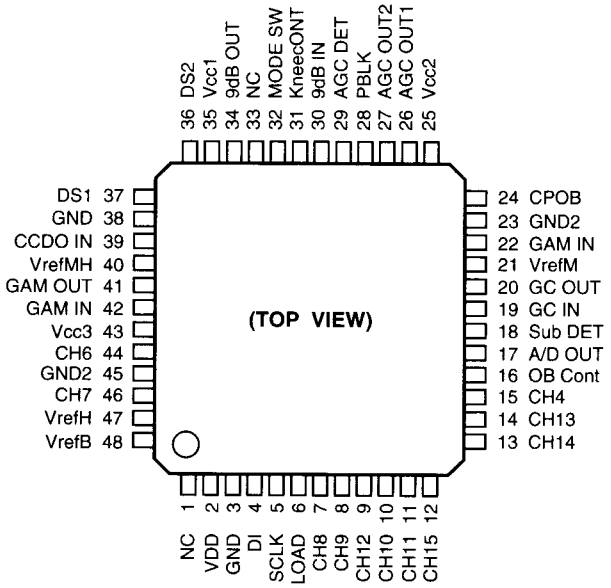
2. Core Mother Board

2.1. IC5 on the Core Mother Board is using the +3.3V Regulator IC S81233PGT1.
Description of this IC is as follows:





2.2. IC4 on the Core Mother Board is using the CDS, AGC, GAMMA Control IC AN2108FHP.
Description of this IC is as follows:

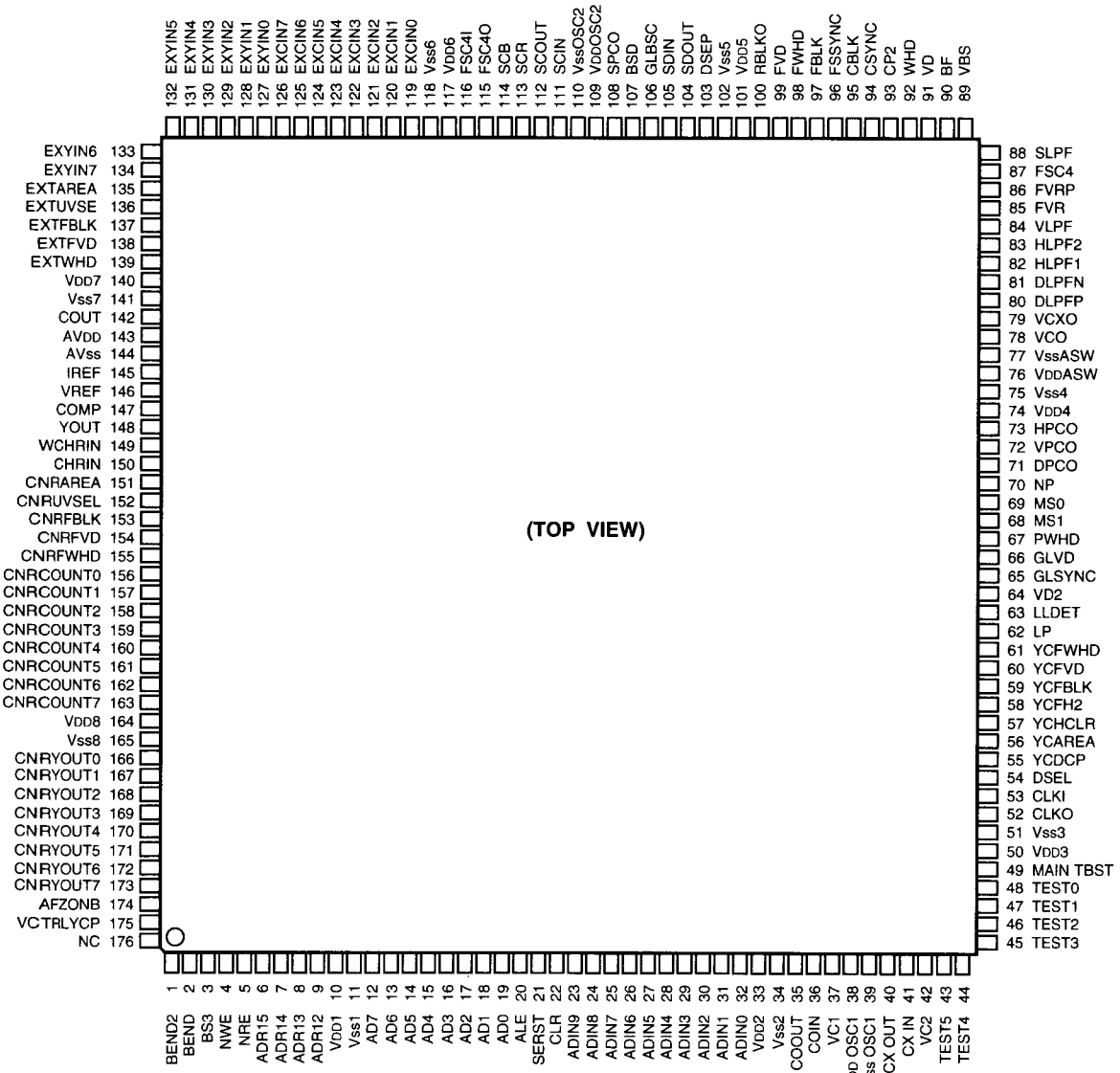


Pin	Name	I/O	Description
1	NC	–	Non connection
2	VDD	O	Refrence Voltage(3.5V) output terminal.
3	GND	–	Ground terminal.
4	DI	I	Serial DATA input terminal for D/A.
5	SCLK	I	Serial Clock Pulse input terminal for D/A.
6	LOAD	I	Load signal input terminal for D/A.
7	CH8	O	Analog DATA output terminals for D/A Converter circuit.
8	CH9	O	
9	CH12	O	
10	CH10	O	
11	CH11	O	
12	CH15	O	
13	CH14	O	
14	CH13	O	
15	CH4	O	
16	OB Cont	I	OB signal adjusting terminal.
17	A/D OUT	O	A/D signal output terminal.
18	Sub DET	I	Sub Amplifier Detector terminal.
19	GC IN	I	Sub Amplifier input terminal.
20	GC OUT	–	Non connection.
21	VrefM	O	Reference Voltage(1.8V) output terminal.
22	GAM IN	I	GAMMA signal input terminal.
23	GND2	–	Ground terminal.
24	CPOB	I	OB Clamp Pulse intput terminal.

Pin	Name	I/O	Description
25	Vcc	–	Power supply terminal.
26	AGC OUT1	O	AGC signal output terminal.
27	AGC OUT2	–	Non Connection.
28	PBLK	I	Pre Blanking Pulse input terminal.
29	AGC DET	I	AGC Detector DC terminal.
30	9dB IN	I	CDS signal(9dB) input terminal.
31	Knee Cont	I	TRAP signal input termnal.
32	MODE SW	I	GAMMA mode switching signal input terminal.
33	NC	–	CDS Dummy terminal.
34	9dB OUT	O	CDS signal(9dB) output terminal.
35	Vcc1	–	Power supply terminal.
36	DS2	I	Sampling Pulse DS2 input terminal.
37	DS1	I	Sampling Pulse DS1 input terminal.
38	GND	–	Ground terminal.
39	CCDO IN	I	CCD signal input terminal.
40	VrefMH	O	Reference Voltage(2.7V) output terminal.
41	GAM OUT	O	GAMMA signal output terminal.
42	GAM IN	I	Pre Apature Delay signal input terminal.
43	Vcc3	–	Power supply terminal.
44	CH6	O	Analog DATA output terminal for D/A.
45	GND2	–	Ground terminal.
46	CH7	O	Analog DATA output terminal for D/A.
47	VrefH	O	Reference Voltage(3.0V) output terminal.
48	VrefB	O	Reference Voltage(1.0V) output terminal.

3. Main Board

3.1. IC7 on the Main Board is using the Supper Dynamic Processing DSP IC MN673521.
Description of this IC is as follows:



Pin	Name	I/O	Description
1	BEND2	–	Non connection
2	BEND	O	Border End Pulse output terminal.
3	BS3	–	Non Connection.
4	NWE	I	Write Enable signal input terminal.
5	NRE	I	Read Enable signal input terminal.
6	ADR15	I	Adress DATA input terminals. (8-Bit)
7	ADR14	I	
8	ADR13	I	
9	ADR12	I	
10	VDD1	–	Power supply terminal.
11	Vss1	–	Ground terminal.

Pin	Name	I/O	Description
12	AD7	I/O	DATA Bus terminals.(8-Bit)
13	AD6	I/O	
14	AD5	I/O	
15	AD4	I/O	
16	AD3	I/O	
17	AD2	I/O	
18	AD1	I/O	
19	AD0	I/O	
20	ALE	I	Adress Latch Enable signal input terminal.
21	SERST	I	Reset Pulse input terminal.
22	CLR	I	Clear signal input terminal.

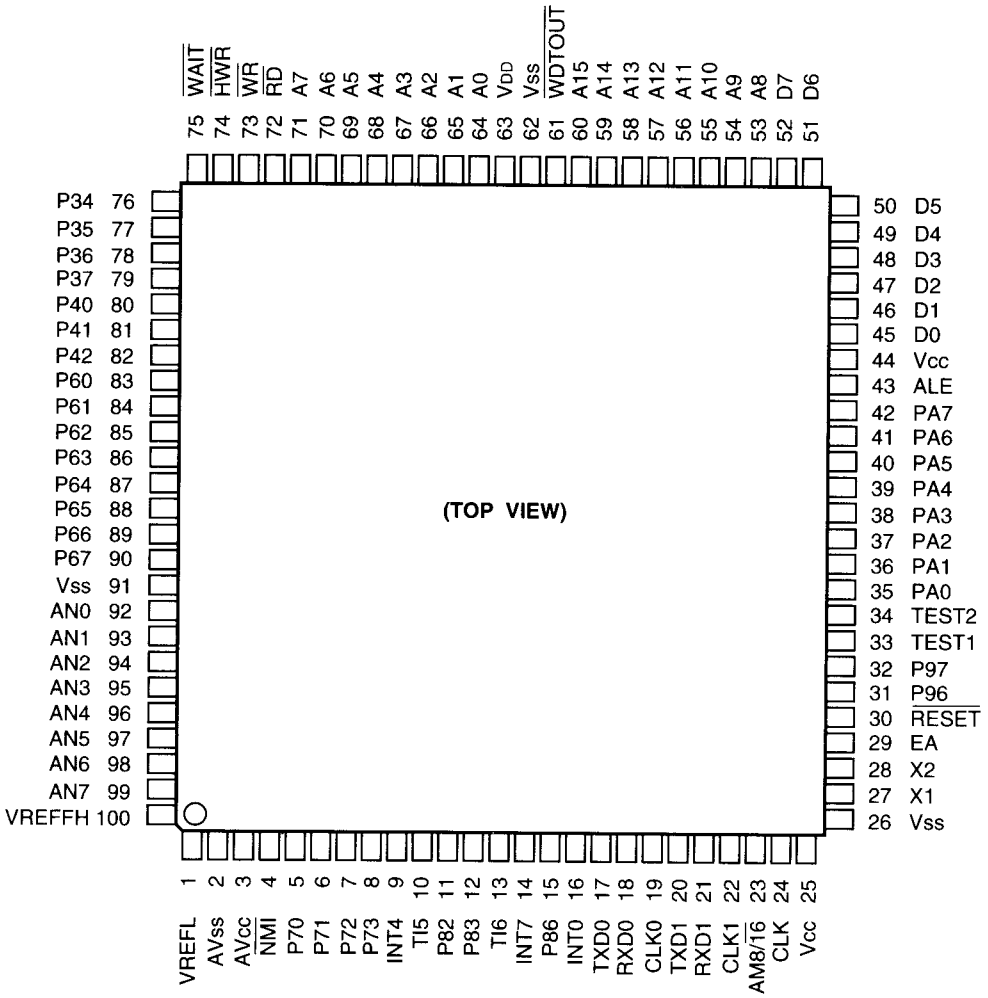
Pin	Name	I/O	Description
23	ADIN9	I	D/A DATA input terminals.(10-Bit)
24	ADIN8	I	
25	ADIN7	I	
26	ADIN6	I	
27	ADIN5	I	
28	ADIN4	I	
29	ADIN3	I	
30	ADIN2	I	
31	ADIN1	I	
32	ADIN0	I	
33	VDD2	–	Power supply terminal.
34	Vss2	–	Ground terminal.
35	COOUT	O	Phase Comparator output terminal.
36	COIN	I	Phase Comparator input terminal.
37	VC1	–	Non Connection.
38	VDDOSC1	–	Ground terminal.
39	VssOSC1	–	Power supply terminal.
40	CXOUT	O	Phase Comparator output terminal.
41	CXIN	I	Phase Comparator input terminal.
42	VC2	–	Non Connection.
43	TEST5	–	Test terminals.
44	TEST4	–	
45	TEST3	–	
46	TEST2	–	
47	TEST1	–	
48	TEST0	–	
49	MINTBST	–	MINTBST signal terminal.
50	VDD3	–	Power supply terminal.
51	Vss3	–	Ground terminal.
52	CLKO	–	Non Connection.
53	CLKI	I	Clock Pulse input terminal.
54	DSEL	–	DSEL signal terminal.
55	YCDCP	I	Digital Clamp Pulse input terminal for Y/C.
56	YCAREA	I	AREA signal input terminal for Y/C.
57	YCHCLR	I	øH Clear Pulse input terminal for Y/C.
58	YCFH2	I	1/2FH Pulse input terminal for Y/C.
59	YCFBLK	I	Blanking Pulse input terminal for Y/C.
60	YCFVD	I	VD Pulse input terminal for Y/C.
61	YCFWHD	I	HD Pulse input terminal for Y/C.
62	LP	O	Line Pulse output terminal.
63	LLDET	I	Line Lock Detect signal input terminal.
64	VD2	I	VD2 input terminal.
65	GLSYNC	I	Sync signal input terminal for G/L.

Pin	Name	I/O	Description
66	GLVD	I	VD Pulse input terminal for G/L.
67	PWHD	I	Pre HD Pulse input terminal.
68	MS1	–	Non Connection.
69	MS0	–	
70	NP	I	NTSC/PAL Selection signal input terminal.
71	DPCO	O	Phase Comparator output terminal.
72	VPCO	O	Vertical Phase Comparator output terminal.
73	HPCO	O	Horizontal Phase Comparator output terminal.
74	VDD4	–	Power supply terminal.
75	Vss4	–	Ground terminal.
76	VDDASW	–	Power supply terminal.
77	VssASW	–	Ground terminal.
78	VCO	I	VCO signal input terminal.
79	VCXO	I	VCXO signal input terminal.
80	DLPFP	I	Digital Low Pass Filter signal input terminal.
81	DLPFN	I	
82	HLPF1	I	Horizontal Low Pass Filter signal input terminal.
83	HLPF2	I	
84	VLPF	I	Vertical Low Pass Filter signal input terminal.
85	FVR	I	FVR signal input terminal.
86	FVRP	I	FVRP signal input terminal.
87	FSC4	I	SC VCXO signal input terminal.
88	SLPF	I	SC Low Pass Filter signal input terminal.
89	VBS	O	Bias Setting signal output terminal.
90	BF	O	Burst Flag Pulse output terminal.
91	VD	–	Non Connection.
92	WHD	I/O	WHD signal input/output terminal.
93	CP2	O	Clamp Pulse output terminal.
94	CSYNC	O	Composite Sync signal output terminal.
95	CBLK	O	Composite Blanking signal output terminal.
96	FSYNC	–	Non Connection.
97	FBLK	O	Blanking Pulse output terminal.
98	FWHD	O	Horizontal Drive Pulse output terminal.
99	FVD	O	Vertical Drive Pulse output terminal.
100	RBLKO	–	Non Connection.
101	VDD5	–	Power supply terminal.
102	Vss5	–	Ground terminal.
103	DSEP	O	DATA Seperation signal output terminal.
104	SDOUT	O	DATA output terminal.
105	SDIN	I	DATA input terminal.
106	GLBSC	I	G/L Burst signal input terminal.
107	BSD	I	Burst DC signal input terminal.

Pin	Name	I/O	Description
108	SPCO	O	SC Phase Comparator output terminal.
109	VDDOSC2	–	Power supply terminal.
110	VssOSC2	–	Ground terminal.
111	SCIN	I	Phase Comparator input terminal.
112	SCOUT	O	Phase Comparator output terminal.
113	SCR	–	Non connection.
114	SCB	–	
115	FSC4O	O	4FSC Clock Pulse output terminal.
116	FSC4I	I	4FSC Clock Pulse input terminal.
117	VDD6	–	Power supply terminal.
118	Vss6	–	Ground terminal.
119	EXCIN0	I	Chrominance DATA input terminals. (8-Bit)
120	EXCIN1	I	
121	EXCIN2	I	
122	EXCIN3	I	
123	EXCIN4	I	
124	EXCIN5	I	
125	EXCIN6	I	
126	EXCIN7	I	
127	EXYIN0	I	Luminance DATA input terminals. (8-Bit)
128	EXYIN1	I	
129	EXYIN2	I	
130	EXYIN3	I	
131	EXYIN4	I	
132	EXYIN5	I	
133	EXYIN6	I	
134	EXYIN7	I	
135	EXTAREA	I	AREA signal input terminal.
136	EXTUVSEL	I	U/V Selection signal input terminal.
137	EXTFBLK	I	Blanking Pulse input terminal.
138	EXTFVD	I	Vertical Drive Pulse input terminal.
139	EXTWHD	I	Horizontal Drive Pulse input terminal.
140	VDD7	–	Power supply terminal.
141	Vss7	–	Ground terminal.
142	COUT	O	Chrominance signal output terminal.
143	AVDD	–	Power supply terminal.
144	AVss	–	Ground terminal.
145	IREF	–	IREF terminal.
146	VREF	–	VREF terminal.
147	COMP	–	COMP terminal.
148	YOUT	O	Luminance signal output terminal.
149	WCHRIN	I	Character signal input terminal.
150	CHRIN	I	

Pin	Name	I/O	Description
151	CNRAREA	O	AREA signal output terminal.
152	CNRUVSEL	O	U/V Selection signal output terminal.
153	CNRFBLK	O	Blanking Pulse output terminal.
154	CNRFVD	O	Vertical Drive Pulse output terminal.
155	CNRFWHD	O	Horizontal Drive Pulse output terminal.
156	CNRCOUT0	O	Chrominance DATA output terminals. (8-Bit)
157	CNRCOUT1	O	
158	CNRCOUT2	O	
159	CNRCOUT3	O	
160	CNRCOUT4	O	
161	CNRCOUT5	O	
162	CNRCOUT6	O	
163	CNRCOUT7	O	
164	VDD8	–	Power supply terminal.
165	Vss8	–	Ground terminal.
166	CNRYOUT0	O	Luminance DATA output terminals. (8-Bit)
167	CNRYOUT1	O	
168	CNRYOUT2	O	
169	CNRYOUT3	O	
170	CNRYOUT4	O	
171	CNRYOUT5	O	
172	CNRYOUT6	O	
173	CNRYOUT7	O	
174	AFZONB	–	AFZONB terminal.
175	VCTRLYCP	–	VCTRLYCP terminal.
176	NC	–	Non connection.

3.2. IC1 on the Main Board is using the 16-Bit/64k Microcomputer IC YWT93C4F9041. Description of this IC is as follows:

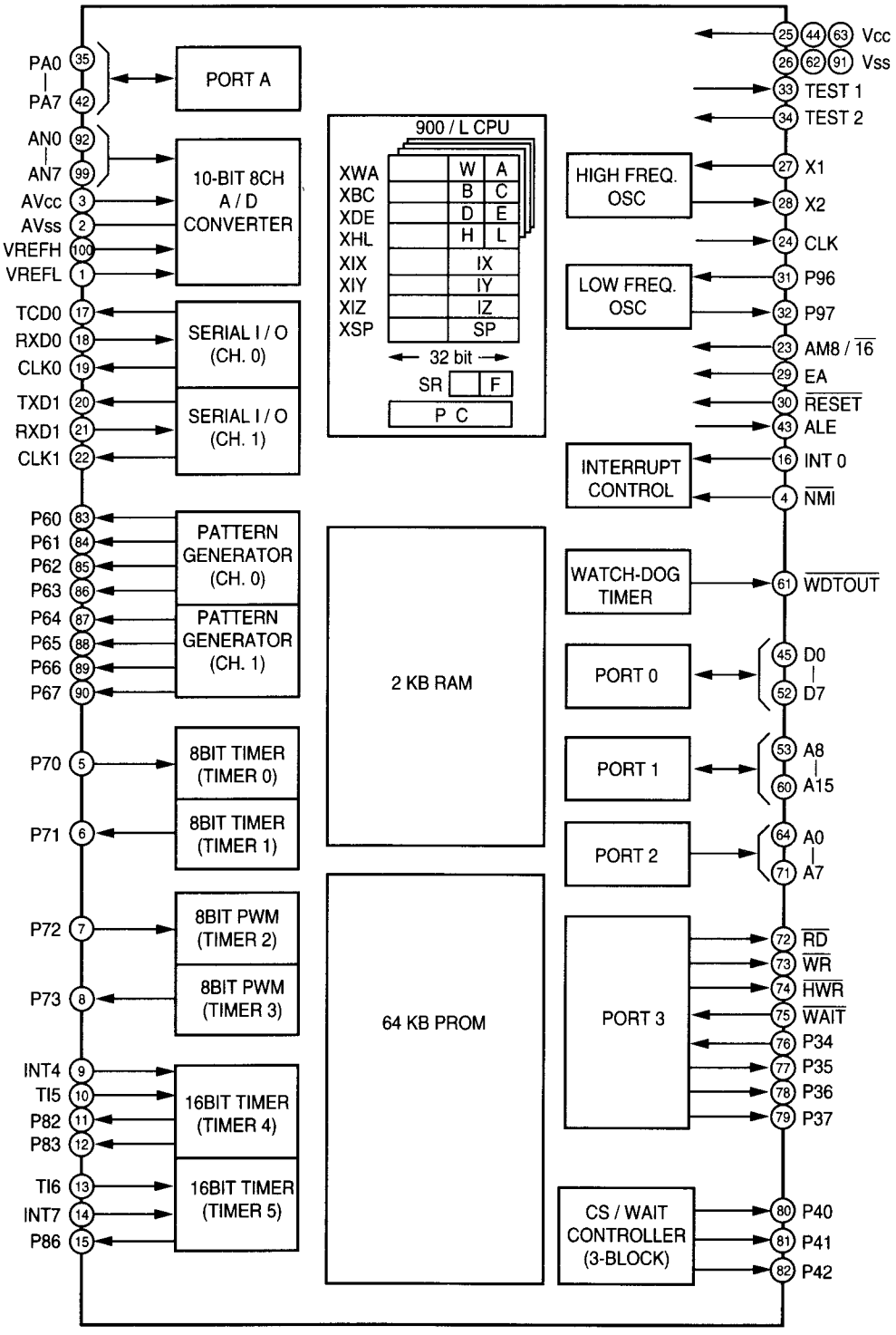


Pin	Name	I/O	Description
1	VREFL	–	Reference Voltage(H) terminal.
2	AVss	–	Ground terminal.
3	AVcc	–	Power supply terminal.
4	NMI	I	Non-Maskable input terminal.
5	P70	I	Field signal input terminal.
6	P71	O	TXDET signal output terminal.
7	P72	–	Non connection.
8	P73	–	
9	INT4	I	Inline Pulse input terminal.
10	TI5	I	VD input terminal.
11	P82	–	Non connection.
12	P83	O	Read Enable signal output terminal.

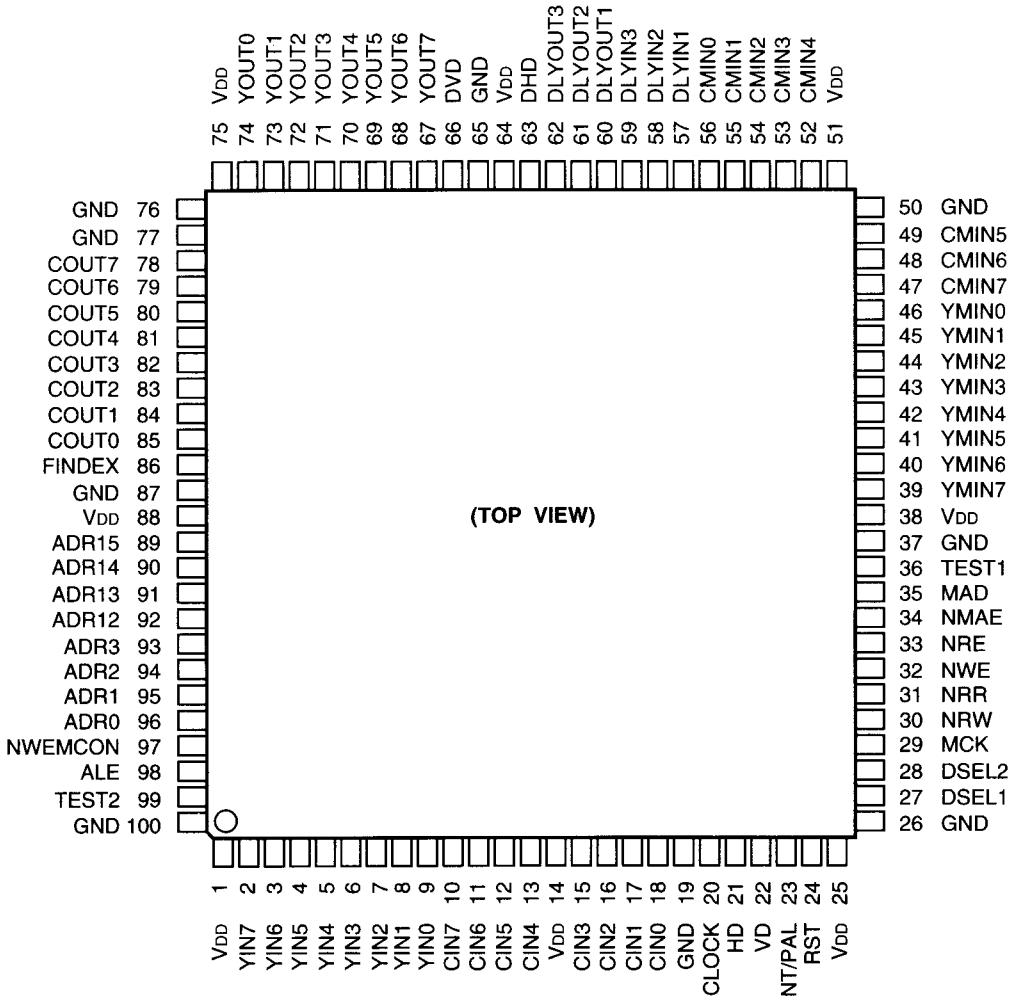
Pin	Name	I/O	Description
13	TI6	I	Border End Pulse input terminal.
14	INT7	–	Non connection.
15	P86	–	
16	INT0	–	
17	TXD0	O	Serial Transmitting DATA output terminal.
18	RXD0	I	Serial Receiving DATA input terminal.
19	CLK0	I/O	Serial Clock Pulse in/output terminal.
20	TXD1	O	Serial Transmitting DATA output terminal.
21	RXD1	I	Serial Receiving DATA input terminal.
22	CLK1	–	Non connection.
23	AM8/16	I	Address Mode Select signal input terminal.
24	CLK	–	Non connection.

Pin	Name	I/O	Description
25	Vcc	–	Power supply terminal.
26	Vss	–	Ground terminal.
27	X1	I	Crystal Oscillator input terminal.
28	X2	O	Crystal Oscillator output terminal.
29	EA	I	External Access terminal.
30	$\overline{\text{RESET}}$	I	Reset Pulse input terminal.
31	P96	–	Non connection.
32	P97	–	
33	TEST1	O	Test terminals.
34	TEST2	I	
35	PA0	O	Chip Selection signal output terminal.
36	PA1	O	D/A Load signal output terminal.
37	PA2	O	TG Chip Selection signal output terminal.
38	PA3	I	UP Switch input terminal.
39	PA4	I	DOWN Switch input terminal
40	PA5	I	RIGHT Switch input terminal
41	PA6	I	LEFT Switch input terminal
42	PA7	I	SET Switch input terminal
43	ALE	O	Address Latch Enable signal output terminal.
44	Vcc	–	Power supply terminal.
45	D0	I/O	DATA Bus terminals.
46	D1	I/O	
47	D2	I/O	
48	D3	I/O	
49	D4	I/O	
50	D5	I/O	
51	D6	I/O	
52	D7	I/O	
53	A8	O	Address signal output terminals.
54	A9	O	
55	A10	O	
56	A11	O	
57	A12	O	
58	A13	O	
59	A14	O	
60	A15	O	
61	$\overline{\text{WDTOUT}}$	–	Non Connection.
62	Vss	–	Ground terminal.
63	VDD	–	Power supply terminal.
64	A0	–	Non Connection.
65	A1	–	
66	A2	–	

Pin	Name	I/O	Description
67	A3	–	Non Connection.
68	A4	–	
69	A5	–	
70	A6	–	
71	A7	–	
72	RD	O	Read Strobe signal output terminal.
73	WR	O	Write Strobe signal output terminal.
74	HWR	–	Non connection.
75	$\overline{\text{WAIT}}$	–	
76	$\overline{\text{P34}}$	I	Power On Reset signal input terminal.
77	$\overline{\text{P35}}$	–	Non connection.
78	$\overline{\text{P36}}$	O	Line Lock Pulse Detection signal output terminal.
79	P37	O	HDRBSET signal output terminal.
80	P40	O	FLICKERESS signal output terminal.
81	P41	O	Write Enable signal output terminal for Memory Controller.
82	P42	O	ALE signal output terminal for Memory Controller.
83	P60	O	SERVO signal output terminal.
84	P61	O	NTSC/PAL Selection signal output terminal for Pattern Generator.
85	P62	O	EBUSY signal output terminal for Pattern Generator.
86	P63	O	Character Chip Selection signal output terminal for Pattern Generator.
87	P64	O	TEST terminal for Pattern Generator.
88	P65	O	Line Lock Detection signal output terminal for Pattern Generator.
89	P66	O	RS485 signal output terminal for Pattern Generator.
90	P67	O	ALARM output terminal for Pattern Generator.
91	Vss	–	Ground terminal.
92	AN0	–	Non connection.
93	AN1	–	
94	AN2	–	
95	AN3	–	
96	AN4	–	
97	AN5	–	
98	AN6	–	
99	AN7	–	
100	VREFH	I	Reference Voltage(L) input terminal.


PA0
PA7
PORT A
AN0
AN7
AVcc
AVss
VREFH
VREFL
10-BIT 8CH A / D CONVERTER
TCD0
RXD0
CLK0
SERIAL I / O (CH. 0)
TXD1
RXD1
CLK1
SERIAL I / O (CH. 1)
P60
P61
P62
P63
PATTERN GENERATOR (CH. 0)
P64
P65
P66
P67
PATTERN GENERATOR (CH. 1)
P70
8BIT TIMER (TIMER 0)
P71
8BIT TIMER (TIMER 1)
P72
8BIT PWM (TIMER 2)
P73
8BIT PWM (TIMER 3)
INT4
TI5
P82
P83
16BIT TIMER (TIMER 4)
TI6
INT7
P86
16BIT TIMER (TIMER 5)
900 / L CPU
XWA
XBC
XDE
XHL
XIX
XIY
XIZ
XSP
W A
B C
D E
H L
IX
IY
IZ
SP
32 bit
SR F
P C
2 KB RAM
64 KB PROM
Vcc
Vss
TEST 1
TEST 2
HIGH FREQ. OSC
X1
X2
CLK
LOW FREQ. OSC
P96
P97
AM8 / 16
EA
RESET
ALE
INTERRUPT CONTROL
INT 0
NMI
WATCH-DOG TIMER
WDTOUT
PORT 0
D0
D7
PORT 1
A8
A15
PORT 2
A0
A7
PORT 3
RD
WR
HWR
WAIT
P34
P35
P36
P37
CS / WAIT CONTROLLER (3-BLOCK)
P40
P41
P42

3.3. IC6 on the Main Board is using the Memory Controller for Electric Gain Up IC YWUPD97047GC. Description of this IC is as follows: (for WV-CP650 and WV-CP654)



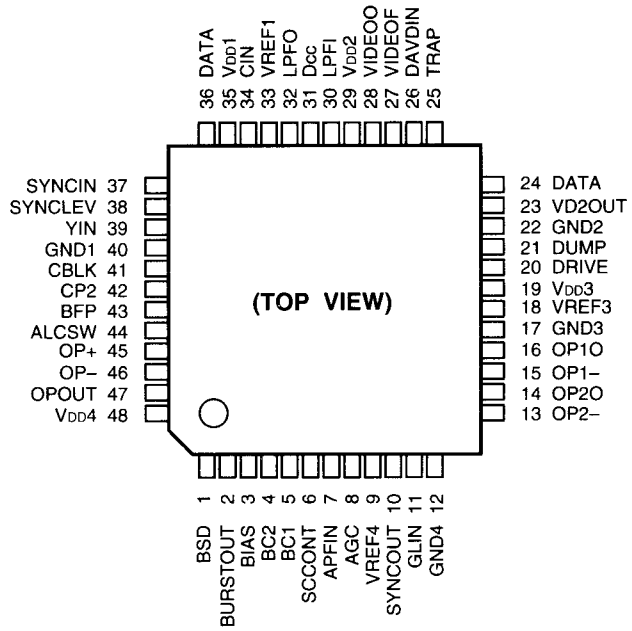
Pin	Name	I/O	Description
1	VDD	–	Power supply terminal.
2	YIN7	I	Luminance DATA input terminals. (8-Bit)
3	YIN6	I	
4	YIN5	I	
5	YIN4	I	
6	YIN3	I	
7	YIN2	I	
8	YIN1	I	
9	YIN0	I	
10	CIN7	I	Chrominance DATA input terminals. (8-Bit)
11	CIN6	I	
12	CIN5	I	
13	CIN4	I	
14	VDD	–	Power supply terminal.

Pin	Name	I/O	Description
15	CIN3	I	Chrominance DATA input terminals. (8-Bit)
16	CIN2	I	
17	CIN1	I	
18	CIN0	I	
19	GND	–	Ground terminal.
20	CLOCK	I	Clock Pulse input terminal.
21	HD	I	Horizontal Drive Pulse input terminal.
22	VD	I	Vertical Drive Pulse input terminal.
23	NT/PAL	I	NTSC/PAL Selection signal input terminal.
24	RST	I	Initial Reset signal input terminal.
25	VDD	–	Power supply terminal.
26	GND	–	Ground terminal.
27	DSEL1	I	DSEL signal input terminals.
28	DSEL2	I	

Pin	Name	I/O	Description
29	MCK	O	Serial Clock Pluse output terminal for Memory.
30	NRW	O	Write Reset Pulse output terminal for Memory.
31	NRR	O	Read Reset Pulse output terminal for Memory.
32	NWE	O	Write Enable signal output terminal for Memory.
33	NRE	O	Read Enable signal output terminal for Memory.
34	NMAE	O	Address Enable signal output terminal for Memory.
35	MAD	O	Address signal output terminal for Memory.
36	TEST1	–	Test terminal.
37	GND	–	Ground terminal.
38	VDD	–	Power supply terminal.
39	YMIN7	I	Memory Luminance DATA input terminals. (8-Bit)
40	YMIN6	I	
41	YMIN5	I	
42	YMIN4	I	
43	YMIN3	I	
44	YMIN2	I	
45	YMIN1	I	
46	YMIN0	I	
47	CMIN7	I	Memory Chrominance DATA input terminals. (8-Bit)
48	CMIN6	I	
49	CMIN5	I	
50	GND	–	Ground terminal.
51	VDD	–	Power supply terminal.
52	CMIN4	I	Memory Chrominance DATA input terminals. (8-Bit)
53	CMIN3	I	
54	CMIN2	I	
55	CMIN1	I	
56	CMIN0	I	
57	DLYIN1	I	Delay signal input terminals.
58	DLYIN2	I	
59	DLYIN3	I	
60	DLYOUT1	O	Delay signal output terminals.
61	DLYOUT2	O	
62	DLYOUT3	O	
63	DHD	O	Horizontal Drive Pulse Output terminal.
64	VDD	–	Power supply terminal.
65	GND	–	Ground terminal.
66	DVD	O	Vertical Drive Pulse output terminal.
67	YOUT7	O	Luminance DATA output terminals. (8-Bit)
68	YOUT6	O	
69	YOUT5	O	
70	YOUT4	O	
71	YOUT3	O	
72	YOUT2	O	
73	YOUT1	O	
74	YOUT0	O	

Pin	Name	I/O	Description
75	VDD	–	Power supply terminal.
76	GND	–	Ground terminal.
77	GND	–	
78	COUT7	O	Chrominance DATA output terminals. (8-Bit)
79	COUT6	O	
80	COUT5	O	
81	GOUT4	O	
82	COUT3	O	
83	COUT2	O	
84	COUT1	O	
85	COUT0	O	
86	FINDEX	O	Field signal output terminal for Microcomputer.
87	GND	–	Ground terminal.
88	VDD	–	Power supply termianl.
89	ADR15	I/O	Address DATA input/output terminals. (8-Bit)
90	ADR14	I/O	
91	ADR13	I/O	
92	ADR12	I/O	
93	ADR3	I/O	
94	ADR2	I/O	
95	ADR1	I/O	
96	ADR0	I/O	
97	NWEMCON	I	Write Enable signal input terminal.
98	ALE	I	Address Latch Enable signal input terminal.
99	TEST2	–	Test terminal.
100	GND	–	Ground terminal.

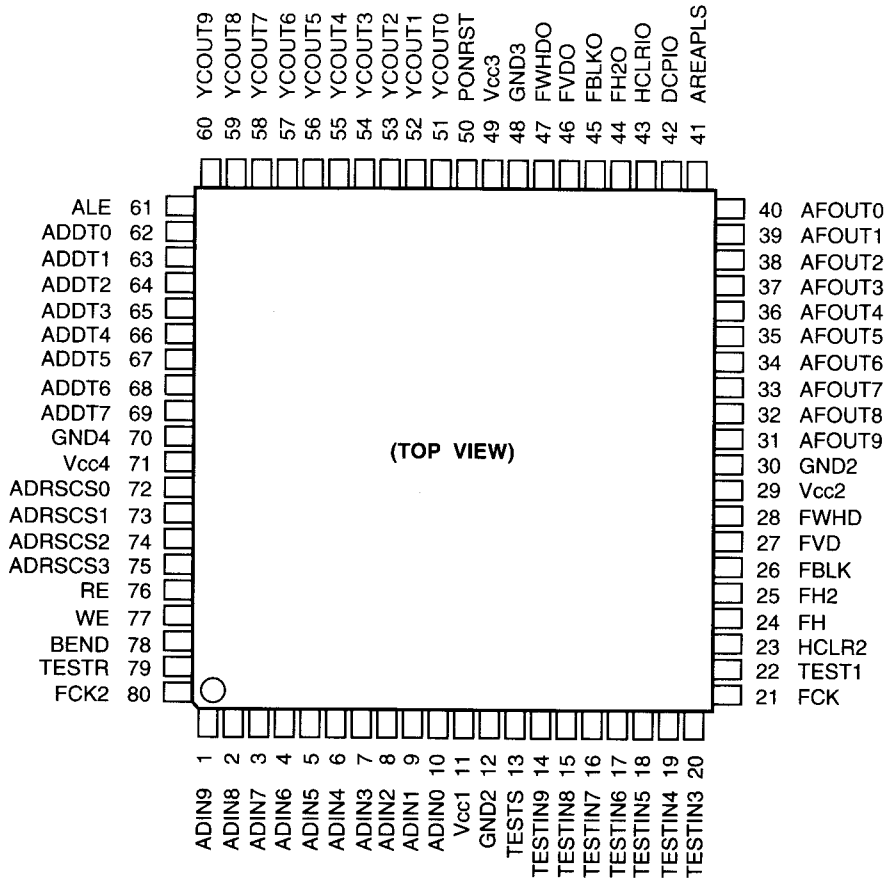
3.4. IC13 on the Main Board is using the Video Out, ALC, Sync Separator IC AN9DE01F. Description of this IC is as follows:



Pin	Name	I/O	Description
1	BSD	O	Bur' t DC signal output ternial.
2	BURSTOUT	O	Burst signal output terminal.
3	BIAS	I	Bias setting signal input terminal.
4	BC2	I	Burst Carrier input terminal.
5	BC1	O	Burst Carrier output terminal.
6	SCCONT	I	Sub Carrier Control signal input terminal.
7	APFIN	I	Active Pass Filter input terminal.
8	AGC	O	AGC signal output terminal.
9	VREF4	O	Reference Voltage output terminal.
10	SYNCOUT	O	SYNC signal output terminal.
11	GLIN	I	G/L SYNC signal input terminal.
12	GND4	–	Ground terminal.
13	OP2–	I	Ope Amp2 – input terminal.
14	OP2O	O	Ope Amp2 output terminal.
15	OP1–	I	Ope Amp1 – input terminal.
16	OP1O	O	Ope Amp1 output terminal.
17	GND3	–	Ground terminal.
18	VREF3	O	Reference Voltage output terminal.
19	VDD3	–	Power supply terminal.
20	DRIVE	O	ALC signal output terminal.
21	DUMP	I	ALC Dumper signal input terminal.
22	GND2	–	Ground terminal.
23	VD2OUT	O	VD2 signal output terminal.
24	DATA	O	VD2 DATA output terminal.

Pin	Name	I/O	Description
25	TRAP	I	Trap signal input terminal.
26	DAVDIN	I	VD2 DATA input terminal.
27	VIDEOF	I	Video signal input terminal.
28	VIDEOO	O	Video signal output terminal.
29	VDD2	–	Power supply terminal.
30	LPFI	I	Low Pass Filter signal input terminal.
31	Dcc	O	DC Control signal output terminal.
32	LPFO	O	Low Pass Filter signal output terminal.
33	VREF1	O	Reference Voltage output terminal.
34	CIN	I	Chrominance signal input terminal.
35	VDD1	–	Power supply terminal.
36	DATA	I	DATA input terminal.
37	SYNCIN	I	Composite Sync signal input terminal.
38	SYNCLEV	I	Sync Control signal input terminal.
39	YIN	I	Luminance signal input terminal.
40	GND1	–	Ground terminal.
41	CBLK	I	Composite Blanking Pulse input terminal.
42	CP2	I	Clamp Pulse input terminal.
43	BFP	I	Burst Flag Pulse input terminal.
44	ALCSW	I	ALC SW selection signal input terminal.
45	OP+	I	Ope Amp + input terminal.
46	OP–	I	Ope Amp – input terminal.
47	OPOUT	O	Ope Amp output terminal.
48	VDD4	–	Power supply terminal.

3.5. IC4 on the Main Board is using the Y/C Signal Processing, D/A Converter IC MN67353. Description of this IC is as follows:

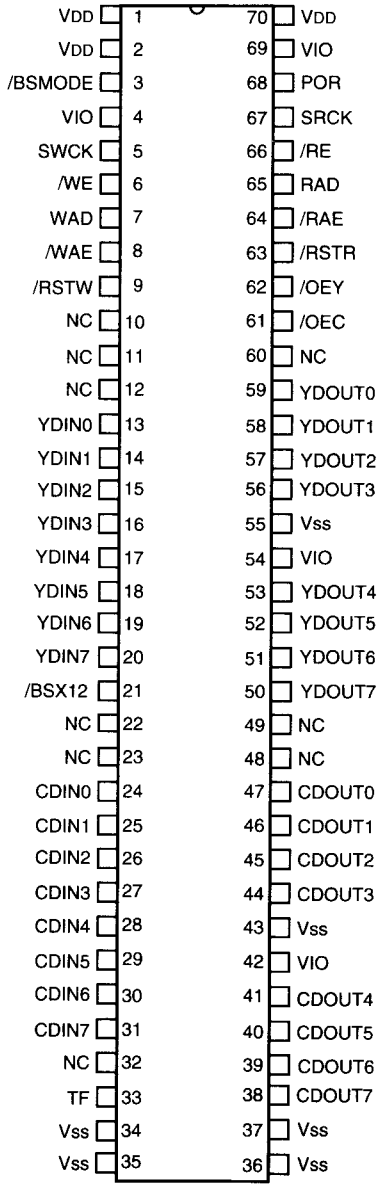


Pin	Name	I/O	Description
1	ADIN9	I	A/D DATA input terminals. (10-Bit)
2	ADIN8	I	
3	ADIN7	I	
4	ADIN6	I	
5	ADIN5	I	
6	ADIN4	I	
7	ADIN3	I	
8	ADIN2	I	
9	ADIN1	I	
10	ADIN0	I	
11	Vcc1	–	Power supply terminal.
12	GND1	–	Ground terminal.
13	TESTS	–	Test terminals.
14	TESTIN9	–	
15	TESTIN8	–	
16	TESTIN7	–	
17	TESTIN6	–	
18	TESTIN5	–	
19	TESTIN4	–	
20	TESTIN3	–	

Pin	Name	I/O	Description
21	FCK	I	Clock Pulse input terminal.
22	TEST1	–	Test terminal.
23	HCLR2	I	øH Clear Pulse input terminal.
24	FH	I	FH Pulse input terminal.
25	FH2	I	1/2FH Pulse input terminal.
26	FBLK	I	Blanking Pulse input terminal.
27	FVD	I	Vertical Drive Pulse input terminal.
28	FWHD	I	Horizontal Drive Pulse input terminal.
29	Vcc2	–	Power supply terminal.
30	GND2	–	Ground terminal.
31	AFOUT9	–	Non connections.
32	AFOUT8	–	
33	AFOUT7	–	
34	AFOUT6	–	
35	AFOUT5	–	
36	AFOUT4	–	
37	AFOUT3	–	
38	AFOUT2	–	
39	AFOUT1	–	
40	AFOUT0	–	

Pin	Name	I/O	Description
41	AREAPLS	O	AREA signal output terminal.
42	DCPIO	O	Digital Clamp Pluse output terminal.
43	HCLRIO	O	øH Clear Pulse output terminal.
44	FH2O	I/O	1/2FH Pulse input/output terminal.
45	FBLKO	–	Non connection
46	FVDO	–	
47	FWHDO	–	
48	GND3	–	Ground terminal.
49	Vcc3	–	Power supply terminal.
50	PONRST	I	Power On Reset signal input terminal.
51	YCOUT0	O	D/A DATA output terminals. (10-Bit)
52	YCOUT1	O	
53	YCOUT2	O	
54	YCOUT3	O	
55	YCOUT4	O	
56	YCOUT5	O	
57	YCOUT6	O	
58	YCOUT7	O	
59	YCOUT8	O	
60	YCOUT9	O	
61	ALE	I	Address Latch Enable signal input terminal.
62	ADDT0	I/O	DATA Bus terminals.(8-Bit)
63	ADDT1	I/O	
64	ADDT2	I/O	
65	ADDT3	I/O	
66	ADDT4	I/O	
67	ADDT5	I/O	
68	ADDT6	I/O	
69	ADDT7	I/O	
70	GND4	–	Ground terminal.
71	Vcc4	–	Power supply terminal.
72	ADRSCS0	O	Address signal output terminals.
73	ADRSCS1	O	
74	ADRSCS2	O	
75	ADRSCS3	O	
76	RE	I	Read Enable signal input terminal.
77	WE	I	Write Enable signal input terminal.
78	BEND	–	Non connection.
79	TESTR	–	Test terminal.
80	FCK2	I	Clock Pulse input terminal.

3.6. IC8 on the Main Board is using the Memory for X32 Electric Gain Up IC YWZA4035H.
Description of this IC is as follows:
(for WV-CP650 and WV-CP654)

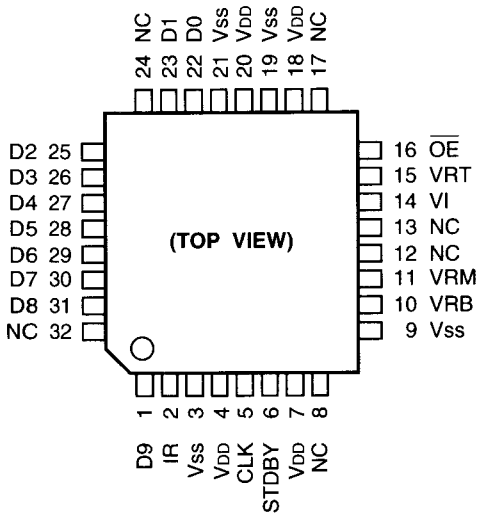


(TOP VIEW)

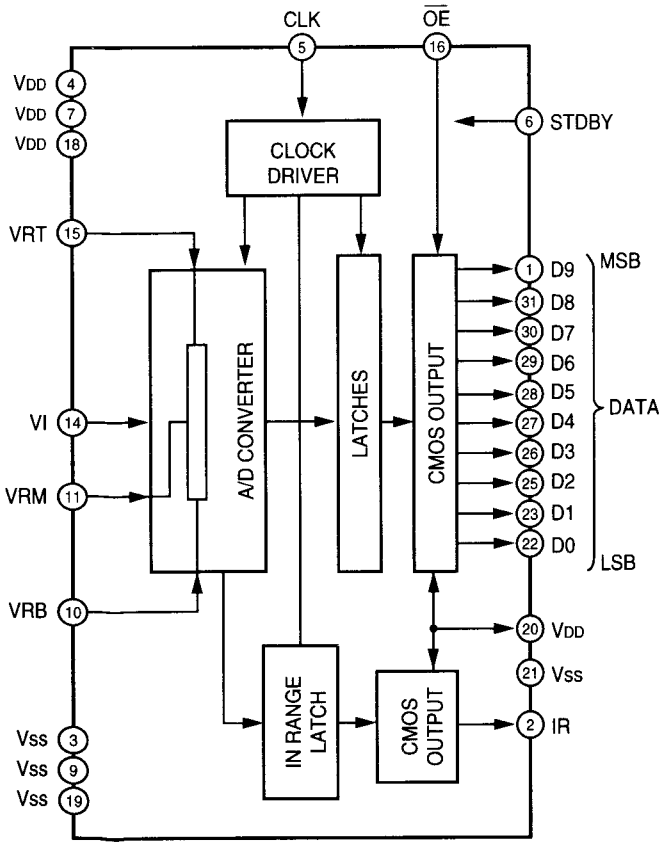
Pin	Name	I/O	Description
1	VDD	–	Power supply terminals.
2	VDD	–	
3	/BSMODE	I	Boundary Scan Mode (x16 mode) terminal.
4	VIO	–	Power supply terminal.
5	SWCK	I	Write Serial Clock Pulse input terminal.
6	/WE	I	Write Enable signal input terminal.
7	WAD	I	Write Address signal input terminal.
8	/WAE	I	Write Address Enable signal input terminal.
9	/RSTW	I	Write Reset Pulse input terminal.
10	NC	–	Non connections.
11	NC	–	
12	NC	–	
13	YDIN0	I	Luminance DATA (x16 mode) input terminals.(8-Bit)
14	YDIN1	I	
15	YDIN2	I	
16	YDIN3	I	
17	YDIN4	I	
18	YDIN5	I	
19	YDIN6	I	
20	YDIN7	I	
21	/BSX12	I	Boundary Scan Mode (x12 mode) terminal.
22	NC	–	Non Connection.
23	NC	–	
24	CDIN0	I	Chrominance DATA (x16 mode) input terminals.(8-Bit)
25	CDIN1	I	
26	CDIN2	I	
27	CDIN3	I	
28	CDIN4	I	
29	CDIN5	I	
30	CDIN6	I	
31	CDIN7	I	
32	NC	–	Non Connection.
33	TF	–	Test terminal.
34	Vss	–	Ground terminals.
35	Vss	–	

Pin	Name	I/O	Description
36	Vss	–	Ground terminal.
37	Vss	–	
38	CDOUT7	O	Chrominance DATA (x16 mode) output terminals.(8-Bit)
39	CDOUT6	O	
40	CDOUT5	O	
41	CDOUT4	O	
42	VIO	–	Power supply terminal .
43	Vss	–	Ground terminal.
44	CDOUT3	O	Chrominance DATA (x16 mode) output terminals.(8-Bit)
45	CDOUT2	O	
46	CDOUT1	O	
47	CDOUT0	O	
48	NC	–	Non connection.
49	NC	–	
50	YDOUT7	O	Luminance DATA (x16 mode) output terminals.(8-Bit)
51	YDOUT6	O	
52	YDOUT5	O	
53	YDOUT4	O	
54	VIO	I	Power supply terminal.
55	Vss	–	Ground terminal.
56	YDOUT3	O	Luminance DATA (x16 mode) output terminals.(8-Bit)
57	YDOUT2	O	
58	YDOUT1	O	
59	YDOUT0	O	
60	NC	–	Non connection.
61	/OEC	O	C/Y Output Enable terminals. (x16 mode)
62	/OEY	O	
63	/RSTR	I	Read Reset Pulse input terminal.
64	/RAE	I	Read Address Enable signal input terminal.
65	RAD	I	Read Address signal input terminal.
66	/RE	I	Read Enable signal input terminal.
67	SRCK	I	Read Serial Clock Pulse input terminal.
68	POR	I	Power On Reset signal terminal.
69	VIO	–	Power supply terminal.
70	VDD	–	Power supply terminal.

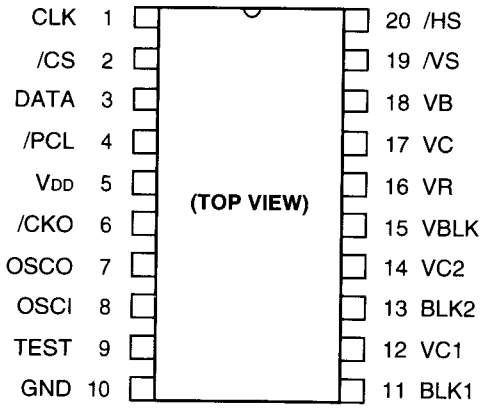
3.7. IC15 on the Main Board is using the 10-Bit A/D Converter IC YWTDA8766GCS.
Description of this IC is as follows:



Pin	Name	I/O	Description
1	D9	O	DATA output terminal. (bit 9) (MSB)
2	IR	I	In Range DATA input terminal.
3	Vss	–	Ground terminal.
4	VDD	–	Power supply terminal.
5	CLK	I	Clock Pulse intput terminal.
6	STDBY	I	Standby mode signal input terminal.
7	VDD	–	Power supply terminal.
8	NC	–	Non connection.
9	Vss	–	Ground terminal.
10	VRB	I	Reference Bottom Voltage intput terminal.
11	VRM	I	Reference Middle Voltage intput terminal.
12	NC	–	Non connections.
13	NC	–	
14	VI	I	Analog signal input terminal.
15	VRT	I	Reference Top Voltage intput terminal.
16	$\overline{OE}$	I	Output Enable signal input terminal.
17	NC	–	Non connection.
18	VDD	–	Power supply terminal.
19	Vss	–	Ground terminal.
20	VDD	–	Power supply terminal.
21	Vss	–	Ground terminal.
22	D0	O	DATA output terminal. (bit 0) (LSB)
23	D1	O	DATA output terminal. (bit 1)
24	NC	O	Non connection.
25	D2	O	DATA output terminal. (bit 2)
26	D3	O	DATA output terminal. (bit 3)
27	D4	O	DATA output terminal. (bit 4)
28	D5	O	DATA output terminal. (bit 5)
29	D6	O	DATA output terminal. (bit 6)
30	D7	O	DATA output terminal. (bit 7)
31	D8	O	DATA output terminal. (bit 8)
32	NC	–	Non connection.

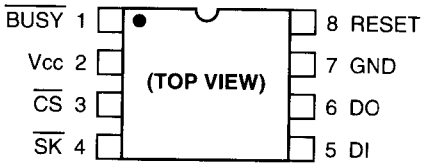


3.8. IC9 on the Main Board is using the Character Generator IC YWD6462GS905.
Description of this IC is as follows:

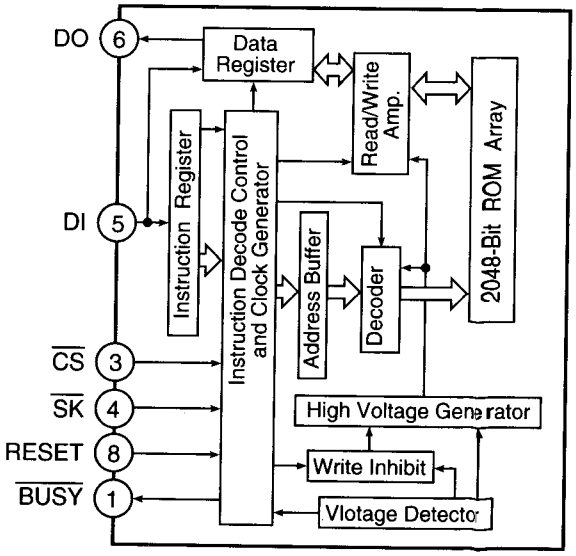


Pin	Name	I/O	Description
1	CLK	I	Clock Pulse input terminal.
2	/CS	I	Chip Select Signal input terminal.
3	DATA	O	DATA output terminal.
4	/PCL	I	Reset Pulse input terminal.
5	VDD	–	Power supply terminal.
6	/CKO	–	Non connection.
7	OSCO	–	
8	OSCI	I	U/V Select signal input terminal.
9	TEST	–	Test terminal.
10	GND	–	Ground terminal.
11	BLK1	–	Non connection.
12	VC1	–	
13	BLK2	–	
14	VC2	O	Character signal output terminal.
15	VBLK	–	Non connection.
16	VR	–	
17	VC	–	
18	VB	O	Character signal output terminal.
19	/VS	I	Vertical Drive Pulse input terminal.
20	/HS	I	1/2FH Pulse input terminal.

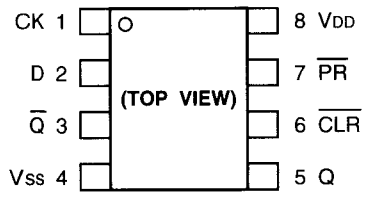
3.9. IC3 on the Main Board is using the 4K-Bit EEPROM IC YWBR9040FT1.
Description of this IC is as follows:



Pin	Name	I/O	Description
1	BUSY	O	Busy Status signal output terminal.
2	Vcc	–	Power supply terminal.
3	CS	I	Chip Select signal input terminal.
4	SK	I	Serial Data Clock Pulse input terminal.
5	DI	I	Serial Data input terminal.
6	DO	O	Serial Data output terminal.
7	GND	–	Ground terminal.
8	RESET	I	Reset Pulse input terminal.



3.10. IC25 on the Main Board is using the Single D-FF with Preset and Clear IC YWTC7W74F.
Description of this IC is as follows:

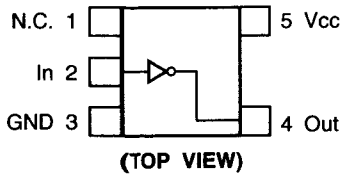


Truth Table

INPUTS				OUTPUTS		Function
$\overline{CLR}$	$\overline{PR}$	D	CK	Q	$\overline{Q}$	
L	H	*	*	L	H	Clear
H	L	*	*	H	L	Preset
L	L	*	*	H	H	——
H	H	L	↓	L	H	——
H	H	H	↓	H	L	——
H	H	*	↑	Qn	$\overline{Qn}$	No Change

* : Don't care.

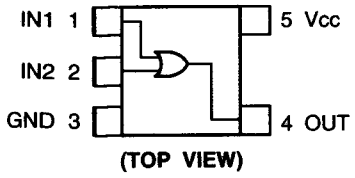
3.11. IC11 and 12 on the Main Board is using the Single Inverter IC YWTC7S04F.
Description of this IC is as follows:



Truth Table

Input	Output
L	H
H	L

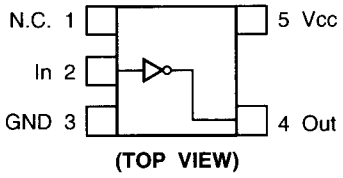
3.12. IC17, 18 and 19 on the Main Board is using the Single 2-Input OR Gate IC YWTC7S32F.
Description of this IC is as follows:



Truth Table

Inputs		Output
IN1	IN2	
L	L	L
H	L	H
L	H	H
H	H	H

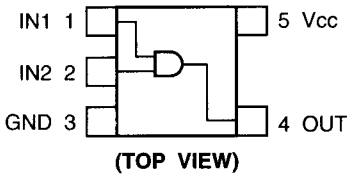
3.13. IC20 and 23 on the Main Board is using the Single Inverter IC YWTC7S04FUL.
Description of this IC is as follows:



Truth Table

Input	Output
L	H
H	L

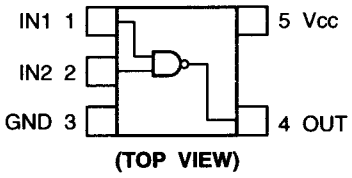
3.14. IC21 and 22 on the Main Board is using the Single 2-Input AND Gate IC YWTC7S08FUL.
Description of this IC is as follows:



Truth Table

Inputs		Output
IN1	IN2	
L	L	L
H	L	L
L	H	L
H	H	H

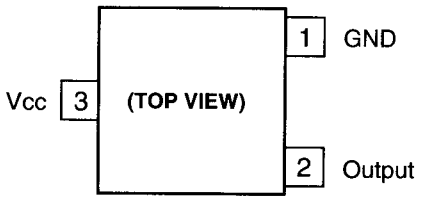
3.15. IC24 on the Main Board is using the Single 2-Input NAND Gate IC TC7S00FUL.
Description of this IC is as follows:

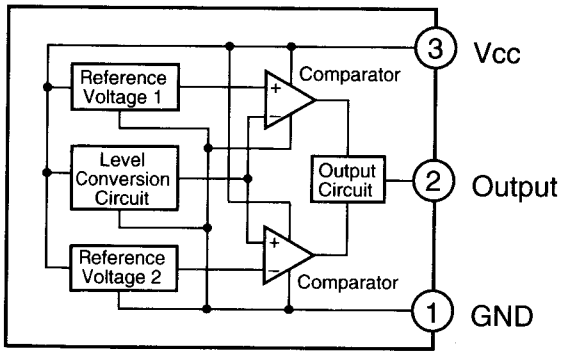


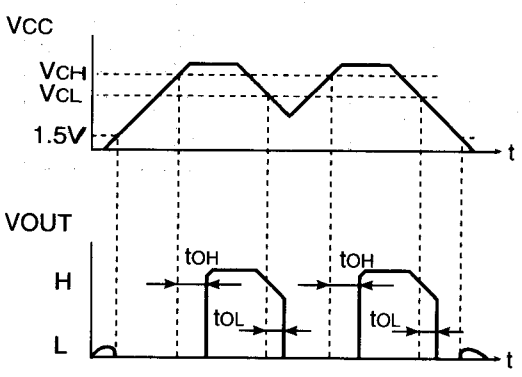
Truth Table

Inputs		Output
IN1	IN2	
L	L	H
H	L	H
L	H	H
H	H	L

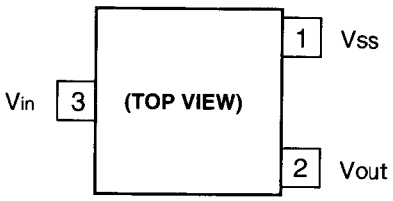
3.16. IC2 on the Main Board is using the 3.5V Reset IC MN13821.
Description of this IC is as follows:

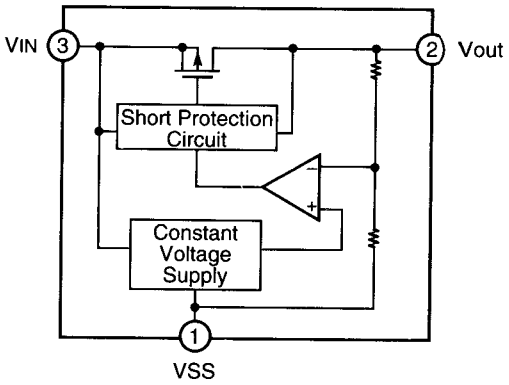






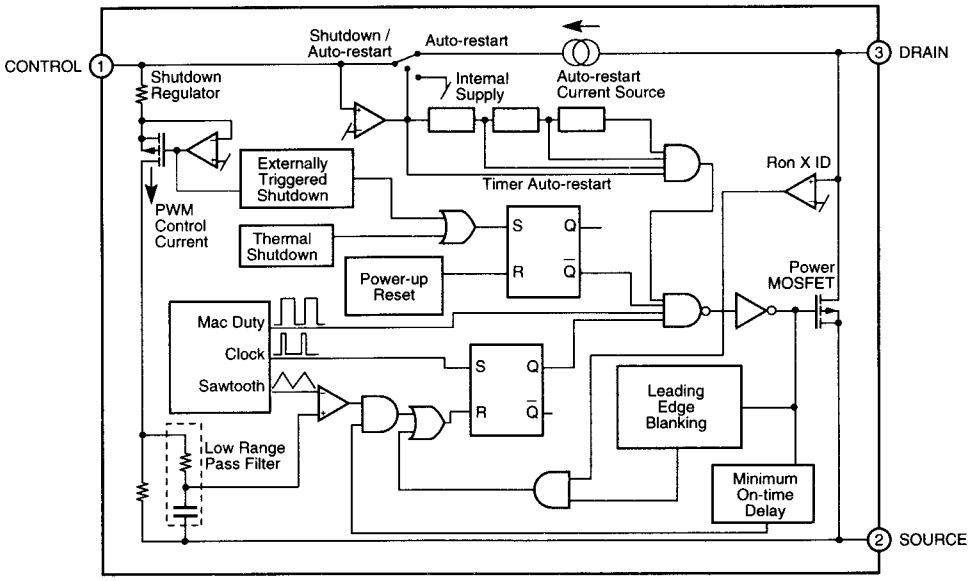
3.17. IC26 on the Main Board is using the +5V Regulator IC XC62AP4702M.
Description of this IC is as follows:





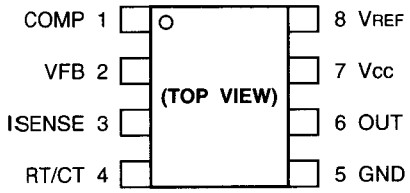
4. Power Board (for WV-CP450 and WV-CP650)

4.1. IC1 on the Power Board is using the Switching Regulator IC MIP160.
Description of this IC is as follows:

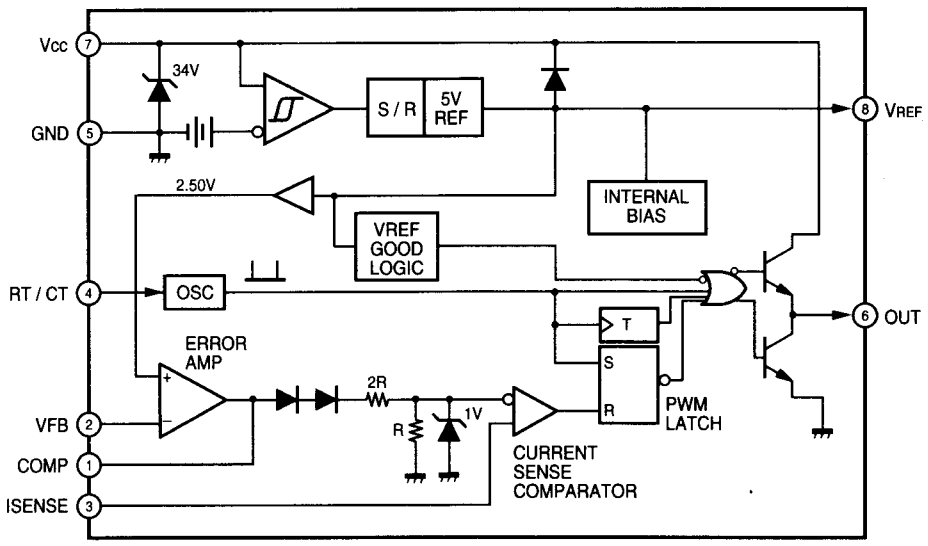


5. Power Board (for WV-CP454 and WV-CP654)

5.1. IC1 on the Power Board is using the Switching Regulator IC YWUC2843NU.
Description of this IC is as follows:



Pin	Name	I/O	Description
1	COMP	I	Comparator input terminal.
2	VFB	I	Error Amp – input terminal.
3	ISENSE	I	Current Sense input terminal.
4	RT/CT	–	Timing Resistor / Timing Capacitor connecting terminal.
5	GND	–	Ground terminal.
6	OUT	O	Signal output terminal.
7	Vcc	–	Power supply terminal.
8	VREF	O	Reference Voltage output terminal.



ABOUT YOUR COMPUTER

In order to run the E.V.R. (Electric Variable Resistor) adjustment program your IBM-PC/AT Type or compatible must meet the following requirements:

- The DOS Operating System must be 3.3 or higher.
- The Operating System must be 100% compatible with your computer.
- The memory in your IBM-PC must be at least 640k-bytes, and 512k-bytes shall be available to the E.V.R. adjustment program.

Installing E.V.R. Adjustment Program

- The Example given here is for A 2 drive computer, your procedure might vary slightly depending on drive configuration.
- Formatting new disk and making a copy of DOS Operating System.

a) Insert disk containing DOS operating system into your floppy drive (for example, drive A) and type **A:**
b) Insert new disk into your floppy drive (for example, drive B).
c) Format and make a copy of DOS operating system from your original disk to new disk by typing **FORMAT B:/S** and press the **ENTER** key.
d) Type **COPY ANSI. SYS B:** and press the **ENTER** key.

- Install E.V.R. Adjustment Program onto formatted new disk with DOS operating system.

FOR WV-CP650

e) Take out original disk containing DOS operating system from your floppy drive (drive A) and insert disk containing E.V.R. adjustment program into your floppy drive (drive A) and type **A:**
f) At the prompt, type **CD IBMPC** and press the **ENTER** key .
g) If required, type **COPY CONFIG.SYS B:** and press the **ENTER** key.
h) Type **CD PAL** for PAL.
i) Type **COPY ADJ3E . EXE B:** and press the **ENTER** key.
j) Type **CD** and press the **ENTER** key.
k) Type **CD SEQ** and press the **ENTER** key.
l) Type **COPY CP650E. SEQ B:** and press the **ENTER** Key.
m) Type **CD** and press the **ENTER** key.
n) Type **CD EVR** and press the **ENTER** key.
o) Type **COPY CP650E. EVR B:** and press the **ENTER** key.
p) After completing installation of program, you are ready to use the E.V.R. adjustment program.

Note:

When completed the new disk should be a bootable disk which contains the following files:

1. COMMAND COM
2. ANSI SYS
3. CONFIG SYS
4. ADJ3E EXE
5. CP650E SEQ
6. CP650E EVR

ADJUSTMENT PROCEDURE

1. Test Equipment Required

The following test Equipment are required for adjustment of the Colour CCTV Camera WV-CP450, WV-CP454, WV-CP650 and WV-CP654.

- Oscilloscope
- Frequency Counter
- Digital Voltmeter
- Vectorscope
- Waveform Monitor
- Underscanned Colour Video Monitor
- Video Signal Generator
- 12 V DC Power Supply Unit
- Lux Meter
- Lighting (275 footcandles (2,750 ± 150 lux), Colour Temperature 5,100 ± 100 K)
- Personal Computer (IBM PC/AT type or equivalent)
- Standard Straight RS-232C Cable
- ALC Lens (WV-LA9C3A, WV-LA12 or equivalent)
- Manual Iris Lens
- Colour Temperature Conversion Filters (KENKO : W12, C4, C12 or equivalent)
- ND8 Filter
- White Chart or White Paper
- Radiation Chart
- Logarithmic Gray Scale Chart as shown Fig. 1-1. (Part Number:YWV2310RB99)

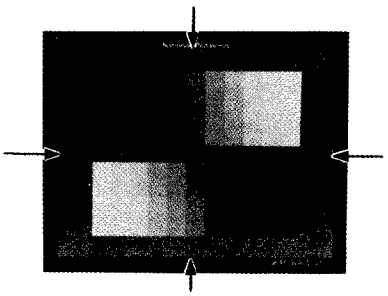


Fig. 1-1

- Colour Chip Chart as shown in Fig. 1-2. (Part Number: YWV2100RB98)

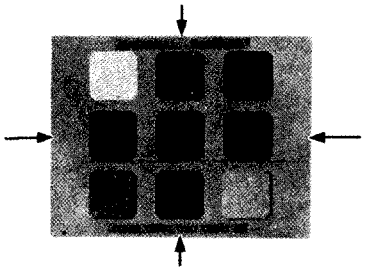


Fig. 1-2

- Extension Cable as shown in Fig. 1-3. (Part Number: YWV0EA1171AN)

Fig. 1-3

- Electric Variable Resistor (E. V. R.) kit as shown in Fig. 1-4. (Part Number: YWV0EA1174AN)

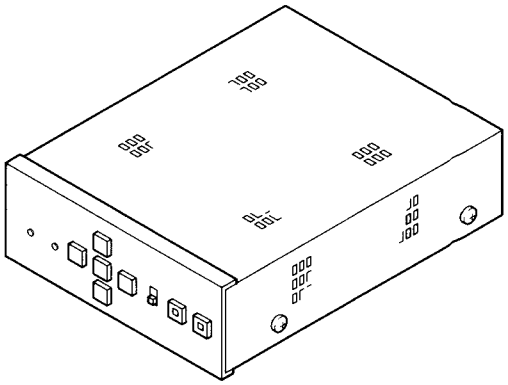


Fig. 1-4

- Make a conversion cable as follows.

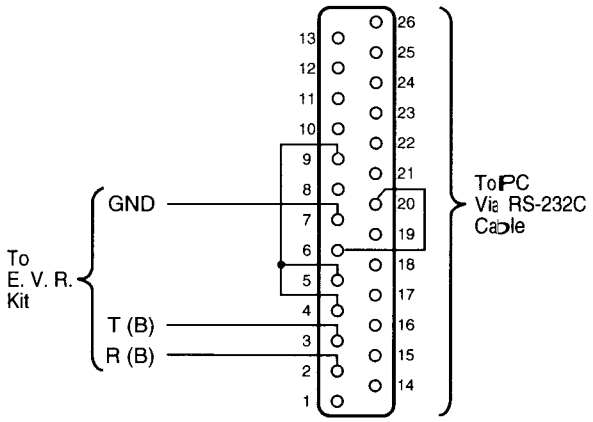


Fig. 1-5

2. Disassembling Procedure for Adjustment

- Referring to Fig. 2-1, remove two screws that secure the Camera Mounting Adaptor and remove the Camera Mounting Adaptor.

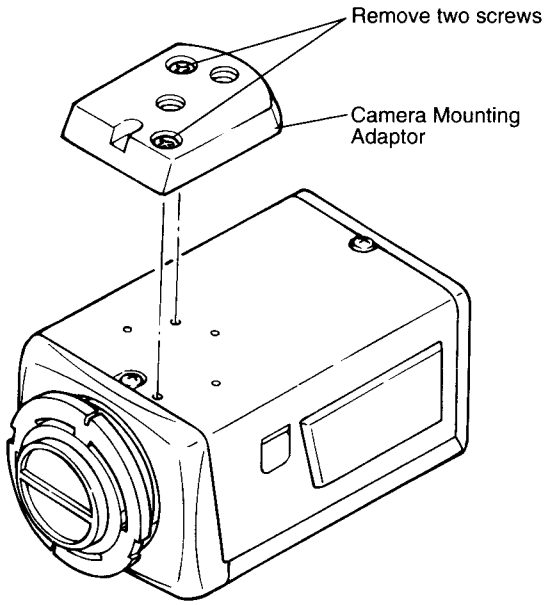


Fig. 2-1

- Referring to Fig. 2-2, remove two screws that secure the Cover and remove the Cover.

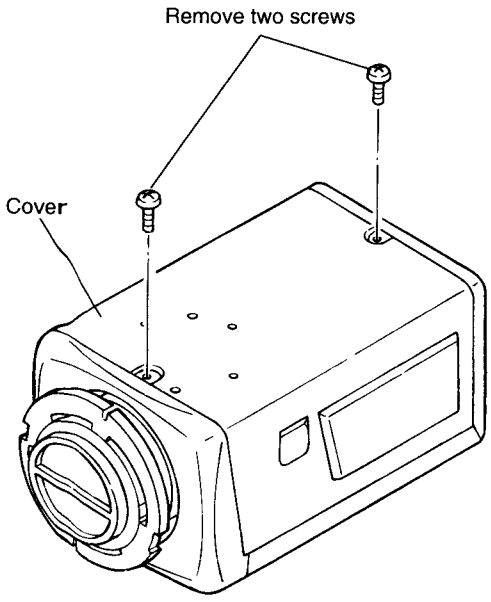


Fig. 2-2

- Referring to Fig. 2-3, remove one screw that secure the Rear Escutcheon and Rear Panel remove the Rear Escutcheon and Rear Panel.

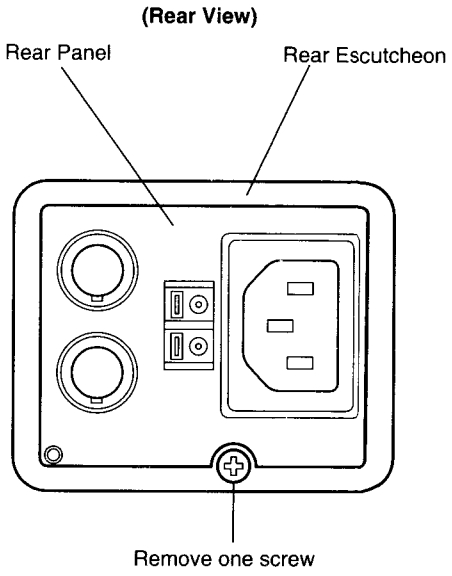


Fig. 2-3

- Referring to Fig. 2-4, remove one screw that secure the Front Escutcheon Unit.

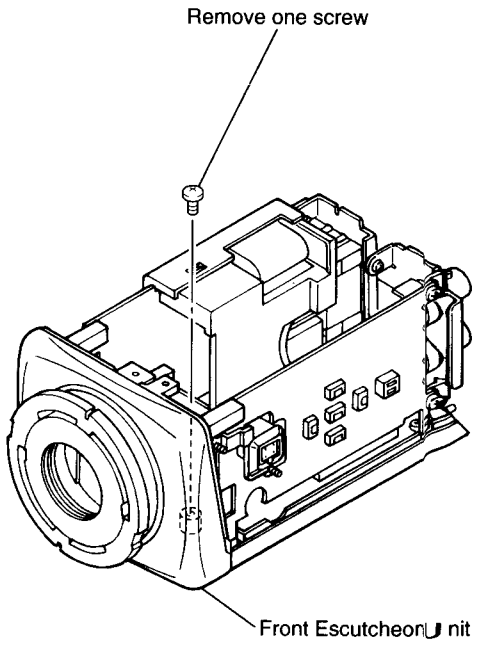


Fig. 2-4

- Referring to Fig. 2-5, disconnect the connector CN2 on the Main Board that secure the I/F Board and Alarm Board and remove the I/F Board and Alarm Board.
- Remove one screw that secure the Earth Lug and Washer and remove the Earth Lug and Washer (For WV-CP450 and WV-CP650 only).
- Disconnect the connector CN4 on the Main Board and remove the Power Board.
- Remove four screws that secure the Main Board and remove the Main Board from the Chassis.

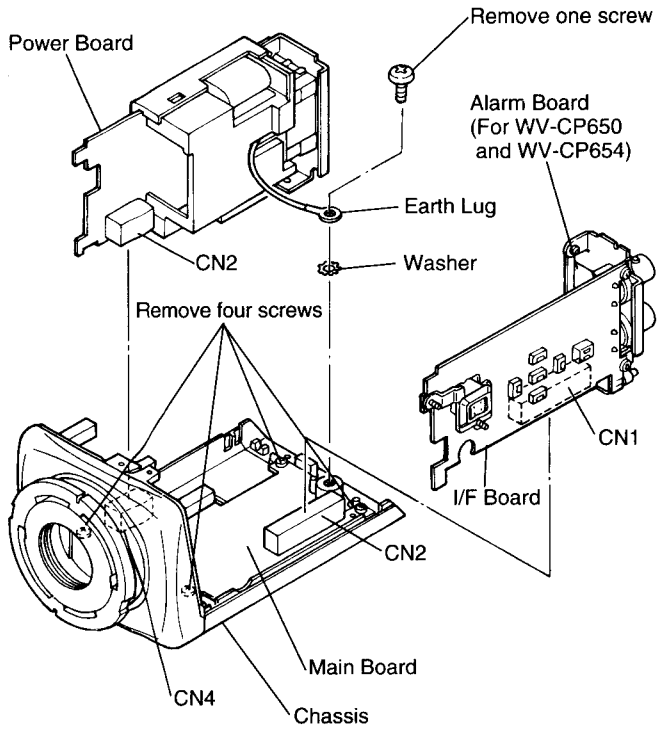


Fig. 2-5

- Reconnect the Extension Cable, between CN4 on the Main Board and CN2 on the Power Board for Adjustment.
- Reconnect the Main Board and I/F Board.

3. Head Optical Ass'y Replacement Procedure

- Disassemble the Camera while referring to the **2. Disassebling Procedure for Adjustment**.
- Referring to Fig. 3-1, remove two screws that secure the Core Mother Board on the Front Escutcheon Unit and remove the Head Optical Ass'y on the Front Escutcheon Unit.
- Replace Head Optical Ass'y with new one.

(Rear View)

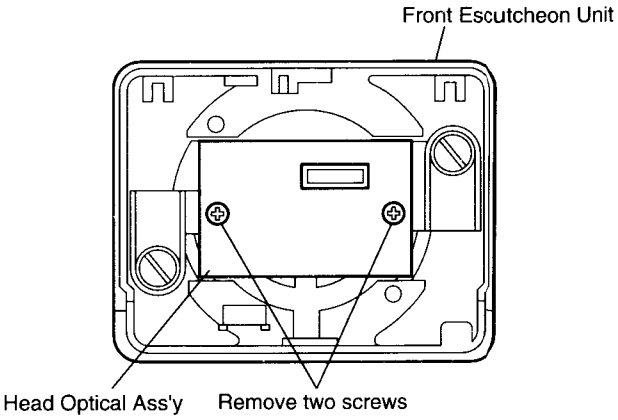


Fig. 3-1

4. Connection and Setting Up for Adjustment

4.1. Connection

- The Fig. 4-1 shows the connecting diagram for the adjustment procedure.

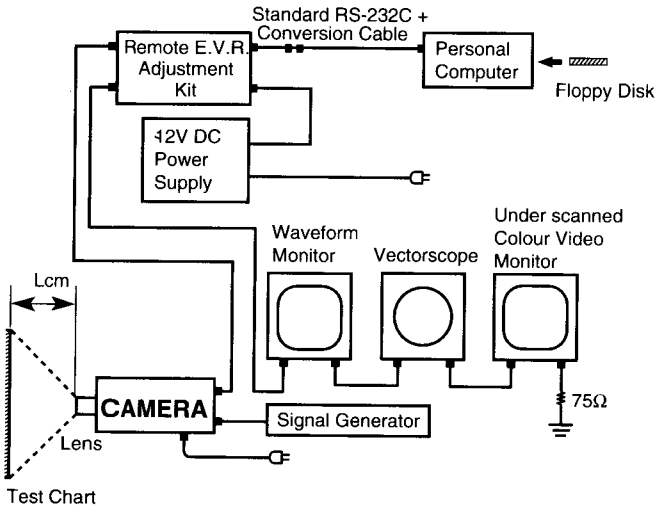


Fig. 4-1

- Connect the Underscanned Colour Video Monitor through the E.V.R. Kit, Waveform Monitor and Vectorscope to the Video Output Connector on the Rear Panel of the WV-CP450, WV-CP454, WV-CP650 or WV-CP654 using the coaxial cable.
- Terminate the input terminal of the Underscanned Colour Video Monitor with 75Ω.
- **For the WV-CP454 and WV-CP654,**
  Connect the AC or DC power Units to the AC/DC Compatible Input Terminal on the Rear Panel of the WV-CP454 and WV-CP654.
- Connect the probe of the Digital Voltmeter, Oscilloscope or Frequency Counter at the desired Test Point each adjustment step.

4.2. Initial Position of the Switch for Adjustment

- An initial setting of the Switch on the Left side Panel of the WV-CP450, WV-CP454, WV-CP650 and WV-CP654 as follows:
  Gen-Lock Termination Switch
  (G/L 75Ω/Hi-Z) 75Ω

- The adjustments should be done with this initial setting, unless otherwise specified.

4.3. Setting Up for Standard Picture

- The adjustment should be done after 10 minutes warmup.
- Set the Logarithmic Gray Scale Chart.
- Mount the ALC Lens WV-LA12 on the Camera.
- Incident light of 2,750 ± 150 lux on the Logarithmic Gray Scale Chart.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Set the Camera so that the Logarithmic Gray Scale Chart becomes full picture on the Underscanned Colour Monitor.
- Adjust the Lens Focus to obtain correct focal point.

5. Adjustment Procedure

- Refer to the Location of the Test Points and Adjusting Controls on the page 41.

■ Adjustment Procedure-1

1. Flange-back Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **Flange-back Adjusting Ring**

- Mount the ALC Lens WV-LA12 on the Camera.
- Set the Radiation Chart.
- Aim the Camera at the Radiation Chart distance of 10m.
- Set the Lens Foucs Ring so that the Lens Foucs becomes approx. 9mm in front from infinity.
- Referring to Fig. 5-1, loosen two screws that secure the Flange-back Adjusting Ring.
- Adjust the Flange-back Adjusting Ring to obtain best focal point.

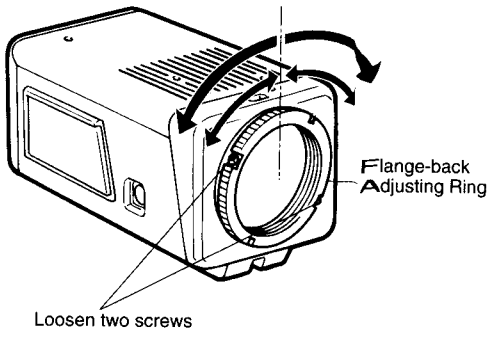


Fig. 5-1

- Tighten two screws that secure the Flange-back Adjusting Ring carefully.
- Change the ALC Lens to WV-LA9C3A from WV-LA12.

■ Adjustment Procedure-2 (E.V.R. Adjustment)

- Insert new disk containing DOS Operating System and the E.V.R. Adjustment program into IBM PC/AT and turns on the Power Switch of IBM PC/AT.
- At the prompt, type **ADJ3E CP650E** and press the **ENTER** key, an initial menu will be displayed in Table 5-1.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * MENU * * * * * * * * * * * * Page (1/1) * * * * * PAL
1.1. SC FREQUENCY (INT)                    13.2. WB 3200K MANU OFFSET B
1.2. SC FREQUENCY (G/L)                    14.1. WB 6500K ATW LIMIT R
2.1. G/L H PHASE MIN.                      14.2. WB 6500K ATW LIMIT B
2.2. G/L H PHASE MAX.                      15.1. 3200K R-GAIN
3. LL PHASE FOR ACtype (50Hz)              15.2. 3200K B-GAIN
4. HI CLIP LEVEL                           15.3. 3200K R MATRIX
5.1. Y GAIN INITIALIZE 1                   16.1. 5100K R-GAIN
5.2. Y GAIN INITIALIZE 2                   16.2. 5100K B-GAIN
6. AD/IN GAIN                              17. HIGHLIGHT CHROMA
7.1. VIDEO OUT GAIN 1
7.2. VIDEO OUT GAIN 2
8. PEDESTAL
9. ALC DC
10. ALC LEVEL
11. BLC LEVEL
12.1. BURST LEVEL
12.2. BURST LEVEL
12.3. BURST LEVEL
12.4. BURST LEVEL
13.1. WB 3200J MANU OFFSET R
<CONTENTS>IC7 / Pin-No. 114 (SC) [MAIN] 4433579 + -10Hz
<INSTRUCTION> PLEASE CHOOSE MENU DATA BY ARROW KEY
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-1

- Press the **SAVE(F5)** key of the Computer, then the Computer will ask you for the file name.
- Give appropriate file name to the Computer. But do not use **CP650E.EVR** for your file.
- This saving procedure is recommended to keep the current adjustment status of the Camera.
- Press the **LOAD(F1)** key and type **CP650E.EVR** and press the **ENTER** key for presetting adjustment of the Camera.

Notes:

- EEPROM mentioned in this adjustment procedure is IC3 on the Main Board.
- RAM mentioned in this adjustment procedure is IC1 on the Main Board.

1.1. Subcarrier Frequency (INT) Adjustment

Test Point: **Pin 114 of IC7 (SC)** **Main Board**
Adjust: **RAM2 (202)** **Main Board**

- The menu as shown in Table 5-2 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL

1.1. SC FREQUENCY (INT)
  IC7 / Pin-No. 114 (SC) [MAIN]      4433579 + - 10Hz

  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM2
<ADDRESS>     : 202
<DATA>        : 77 - 77

<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-2

- Connect the Frequency Counter to Pin Number 114 of IC7.
- Adjust data with the **ARROW** keys so that the Subcarrier Frequency becomes 4.433579 MHz ± 10 Hz.
- Press the **ENTER** key for next adjustment.

1.2. Subcarrier Frequency (G/L) Adjustment

Test Point: **Pin 114 of IC7 (SC)** **Main Board**
Adjust: **RAM2 (201)** **Main Board**

- The menu as shown in Table 5-3 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL

1.2. SC FREQUENCY (G/L)
  IC7 / Pin-No. 114 (SC) [MAIN]      4433579 + - 10Hz

  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM2
<ADDRESS>     : 201
<DATA>        : 7E - 7E

<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-3

- Supply the Composite Video signal to the Gen-Lock Input Connector on the Rear Panel of the Camera.
- Connect the Frequency Counter to Pin Number 114 of IC7.
- Adjust data with the **ARROW** keys so that the Subcarrier Frequency becomes 4.433579 MHz ± 10 Hz.
- Press the **ENTER** key for next adjustment.

2.1. G/L H-Phase (Min.) Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
CN6 (G/L Input Connector) **I/F Board**
Adjust: **RAM3 (39E)** **Main Board**

- The menu as shown in Table 5-4 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * PAL


2.1. G/L H PHASE MIN.
   VIDEO OUT, G/L IN 0 + - 0.0000001 sec


   * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM3
<ADDRESS>     : 39E
<DATA>        : 19-19

<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-4

- Supply the Composite Video signal to the Gen-Lock Input Connector on the Rear Panel of the Camera.
- Connect the CH1 of the Oscilloscope to the G/L Input Connector.
- Connect the CH2 of the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the Video Out signal coincides to the G/L In signal as shown in Fig. 5-2

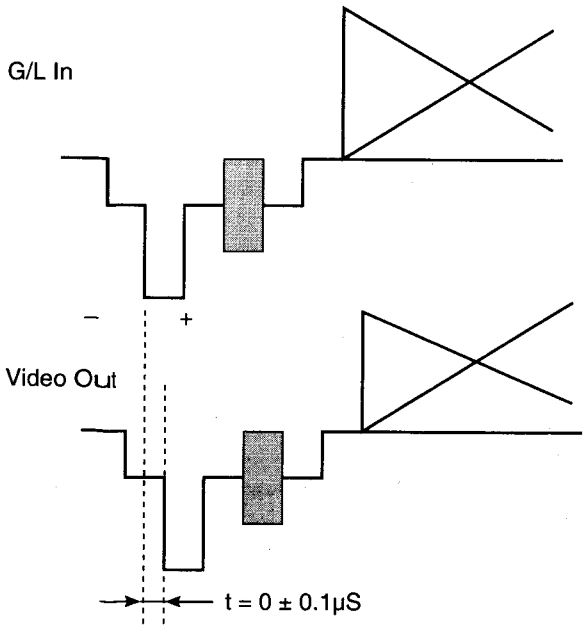


Fig. 5-2

- Press the **ENTER** key for next adjustment.

2.2. G/L H-Phase (Max.) Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
CN6 (G/L Input Connector) **I/F Board**
Adjust: **RAM3 (39F)** **Main Board**

- The menu as shown in Table 5-5 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * PAL


2.2. G/L H PHASE MAX.
   VIDEO OUT, G/L IN -2 + - 0.0000001 sec


   * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM3
<ADDRESS>     : 39F
<DATA>        : 36 - 36

<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-5

- Supply the Composite Video signal to the Gen-Lock Input Connector on the Rear Panel of the Camera.
- Connect the CH1 of the Oscilloscope to the G/L Input Connector.
- Connect the CH2 of the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the Video Out signal becomes as shown in Fig. 5-3.

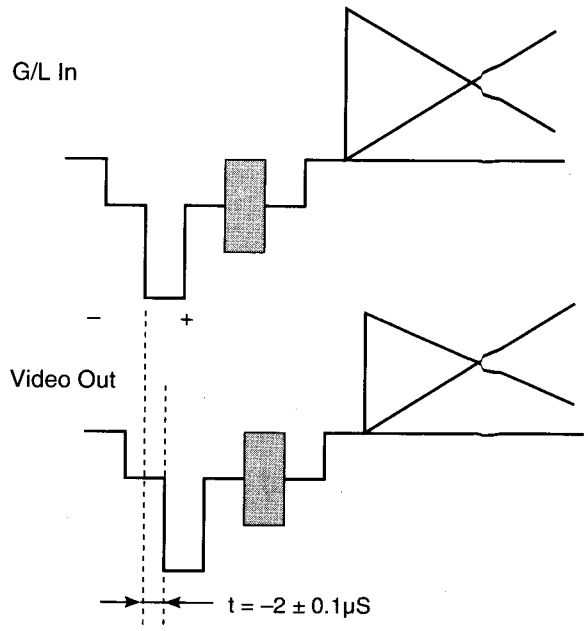


Fig. 5-3

- Press the **ENTER** key for next adjustment.

3. LL Phase Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Pin 1 of CN1 (L) **Power Board**
Adjust: **RAM0 (0B4)** **Main Board**

- The menu as shown in Table 5-6 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
**********EVR**********PAL

3. LL PHASE FOR ACtype (50Hz)
   VIDEO OUT(V SYNC)

**********
<DEVICE>     : RAM0
<ADDRESS>    : 0B4
<DATA>       : 6F - 6F

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)    SAVE (F5)
```

Table 5-6

- Connect the CH1 of the Oscilloscope to the Video Output Connector.
- Connect the CH2 of the Oscilloscope to the Pin 1 of CN1 on the Power Board.
- Trigger the Oscilloscope at V-rate.
- Adjust data with the **ARROW** keys so that the Decay point of V Sync signal coincides delays 2H ± 4H from the zero cross point of the AC Power source as shown in Fig. 5-4.

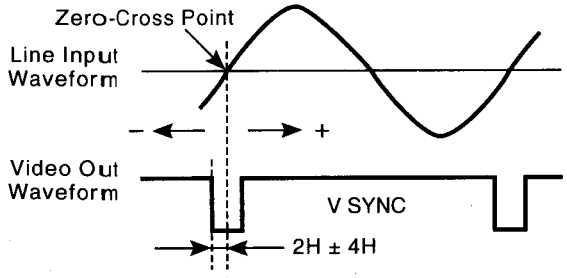


Fig. 5-4

- Press the **ENTER** key for next adjustment.

4. High Clip Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM2 (203)** **Main Board**

- The menu as shown in Table 5-7 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
**********EVR**********PAL

4. HI CLIP LEVEL
   VIDEO OUT  805 + 35 - 0 mV

**********
<DEVICE>     : RAM2
<ADDRESS>    : 203
<DATA>       : 75 - 75

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)    SAVE (F5)
```

Table 5-7

- Change the Colour Temperature from 5100K to 3200K by mount the Filter W12 on the Lens.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that signal level becomes 805 $^{+35}_{-0}$ mV as shown in Fig. 5-5.

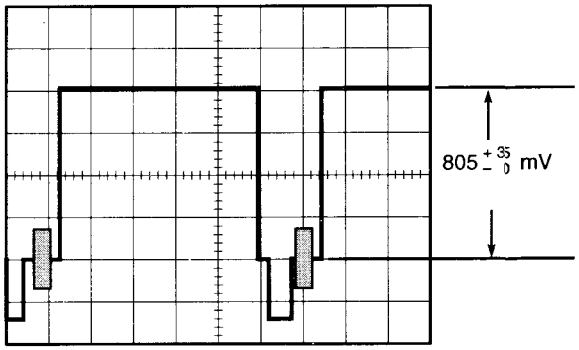


Fig. 5-5

- Press the **ENTER** key for next adjustment.

5.1. Y Gain Initialize 1 Adjustment

Test Point: **Pin 6 of CN2 (CDSOUT)** **Core Mother Board**
Adjust: **RAM2 (20C)** **Main Board**

- The menu as shown in Table 5-8 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
**********EVR**********PAL

5.1. Y GAIN INITIALIZE 1
   CN2 / Pin-No. 6 (CDSOUT) [CORE]  260 + - 30mV, WITH ND8

**********
<DEVICE>     : RAM2
<ADDRESS>    : 20C
<DATA>       : 09 - 09

<MESSAGE>    :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)    SAVE (F5)
```

Table 5-8

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Mount the ND8 Filter on the Lens.
- Connect the Oscilloscope to the Pin Number 6 of CN2.
- Adjust data with the **ARROW** keys so that CDS OUT signal level becomes 260 ± 30 mV as shown in Fig. 5-6.

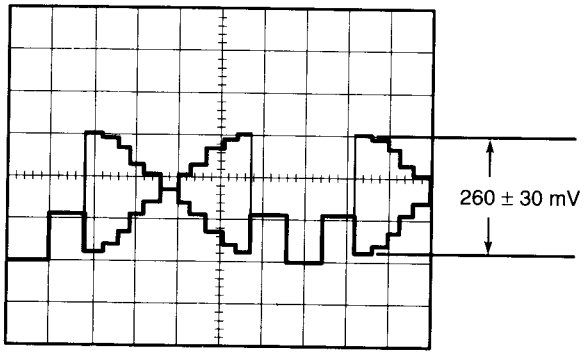


Fig. 5-6

- Press the **ENTER** key for next adjustment.

5.2. Y Gain Initialize 2 Adjustment

Test Point: **Pin 6 of CN2 (CDSOUT) Core Mother Board**
Adjust: **RAM2 (20B)** **Main Board**

- The menu as shown in Table 5-9 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************EVR**********PAL

5.2. Y GAIN INITIALIZE 2
  CN2 / Pin No. 6 (CDSOUT)  260 + - 30mV, WITH ND8

**********************************************
<DEVICE>      : RAM2
<ADDRESS>     : 20B
<DATA>        : 10 - 10
<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)    SAVE (F5)
```

Table 5-9

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Mount the ND8 Filter on the Lens.
- Connect the Oscilloscope to the Pin Number 6 of CN2.
- Adjust data with the **ARROW** keys so that CDS OUT signal level becomes 260 ± 30 mV as shown in Fig. 5-7.

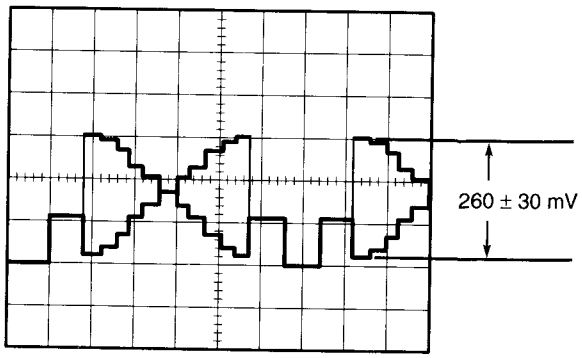


Fig. 5-7

- Press the **ENTER** key for next adjustment.

6. AD/IN Gain Adjustment

Test Point: **Pin 33 of CN1 (AD/IN)** **Main Board**
Adjust: **RAM2 (206)** **Main Board**

- The menu as shown in Table 5-10 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************EVR**********PAL

6. AD/IN GAIN
  CN1 / Pin No. 33 (AD/IN) [MAIN]  800 + - 30mV, WITH ND8

**********************************************
<DEVICE>      : RAM2
<ADDRESS>     : 206
<DATA>        : A1 - A1
<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)    SAVE (F5)
```

Table 5-10

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Mount the ND8 Filter on the Lens.
- Connect the Oscilloscope to the Pin Number 33 of CN1.
- Adjust data with the **ARROW** keys so that AD/IN signal level becomes 800 ± 30 mV as shown in Fig 5-8.

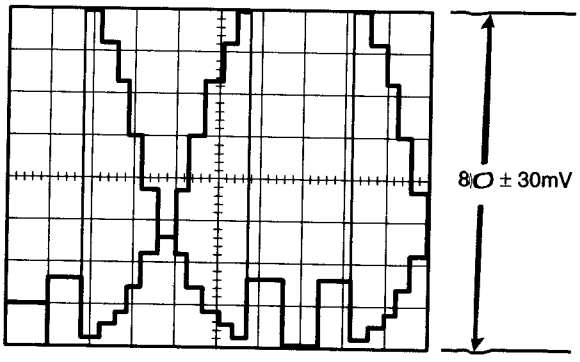


Fig. 5-8

- Press the **ENTER** key for next adjustment.

7.1. Video Out Gain 1 Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0A2)** **Main Board**

- The menu as shown in Table 5-11 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************* EVR ********************** PAL


7.1. VIDEO OUT GAIN 1
   VIDEO OUT  700 + - 50mV, WITH ND8


  ************************************************
<DEVICE>      : RAM0
<ADDRESS>     : 0A2
<DATA>        : F7 - F7
<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)     SAVE (F5)
```

Table 5-11

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Mount the ND8 Filter on the Lens.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that Video signal level becomes 700 ± 50 mV as shown in Fig. 5-9.

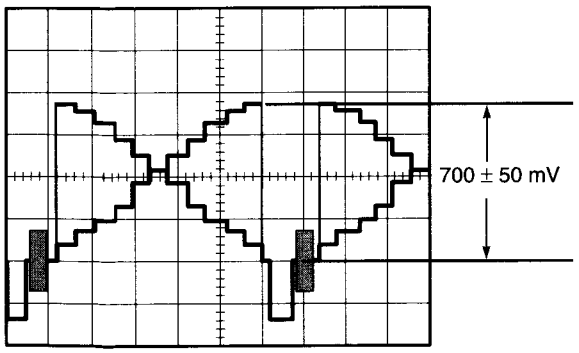


Fig. 5-9

- Press the **ENTER** key for next adjustment.

7.2. Video Out Gain 2 Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0A3)** **Main Board**

- The menu as shown in Table 5-12 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************* EVR ********************** PAL


7.2. VIDEO OUT GAIN 2
   VIDEO OUT  700 + - 50mV, WITH ND8


  ************************************************
<DEVICE>      : RAM0
<ADDRESS>     : 0A3
<DATA>        : 00 - 00
<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)     SAVE (F5)
```

Table 5-12

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Mount the ND8 Filter on the Lens.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that Video signal level becomes 700 ± 50 mV as shown in Fig. 5-10.

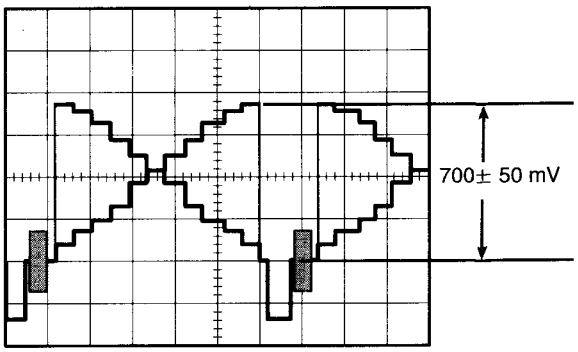


Fig. 5-10

- Press the **ENTER** key for next adjustment.

8. Pedestal Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0B2)** **Main Board**

- The menu as shown in Table 5-13 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************* EVR ********************** PAL


8. PEDESTAL
   VIDEO OUT  PEDESTAL  50 mV + - 5mV


  ************************************************
<DEVICE>      : RAM0
<ADDRESS>     : 0B2
<DATA>        : 17 - 17
<MESSAGE>     :

<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)     SAVE (F5)
```

Table 5-13

- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that Pedestal level becomes 50 ± 5 mV as shown in Fig. 5-11.

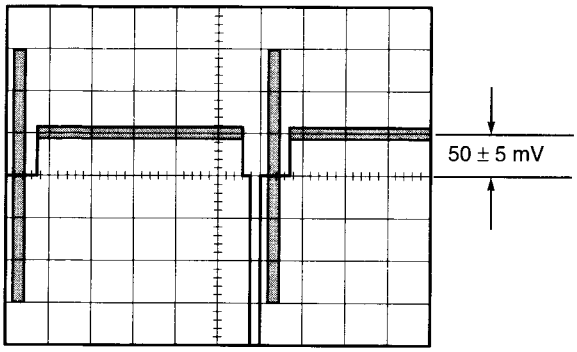


Fig. 5-11

- Press the **ENTER** key for next adjustment.

9. ALC DC Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM1 (119)** **Main Board**

- The menu as shown in Table 5-14 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************EVR********************PAL


9. ALC DC
  0 < MEASURE < 5 : USE ALC LENS


**************************************************
<DEVICE>     :RAM1
<ADDRESS>    :119
<DATA>       :00-00

<MESSAGE>    :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)    SAVE (F5)
```

Table 5-14

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Adjust data with the **ARROW** keys so that the measure level becomes 00 and 05.
- Press the **ENTER** key for next adjustment.

10. ALC Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM1 (11D)** **Main Board**

- The menu as shown in Table 5-15 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************EVR********************PAL


10. ALC LEVEL
  VIDEO OUT  700 + - 50mV


**************************************************
<DEVICE>     :RAM1
<ADDRESS>    :11D
<DATA>       :1B-1B

<MESSAGE>    :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)    SAVE (F5)
```

Table 5-15

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the video signal level becomes 700 ± 50 mV as shown in Fig. 5-12.

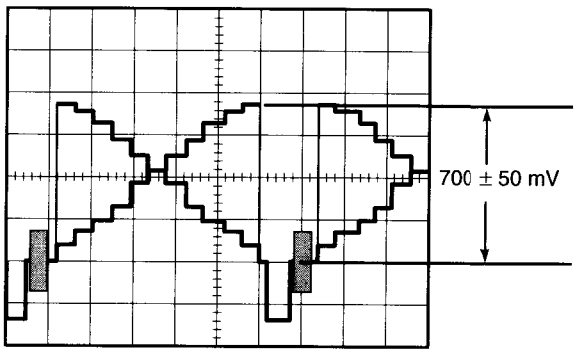


Fig. 5-12

- Press the **ENTER** key for next adjustment.

11. BLC Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM1 (11C)** **Main Board**

- The menu as shown in Table 5-16 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************EVR********************PAL


11. BLC LEVEL
  VIDEO OUT  700 mV + - 50 mV


**************************************************
<DEVICE>     :RAM1
<ADDRESS>    :11C
<DATA>       :17-17

<MESSAGE>    :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)    QUIT (F3)    SAVE (F5)
```

Table 5-16

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the video signal level becomes 700 ± 50 mV as shown in Fig. 5-13.

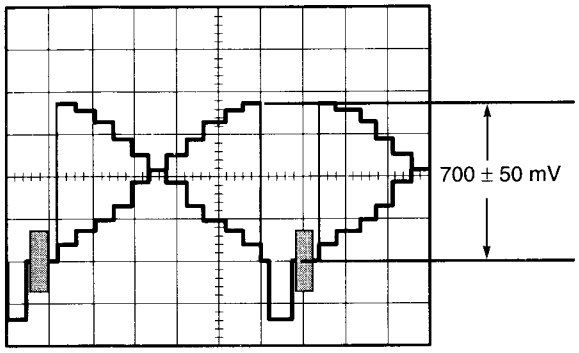


Fig. 5-13

- Press the **ENTER** key for next adjustment.

12. Burst Level Adjustment

- Repeat adjust from steps **12.1** to **12.4** until Burst Level, Phase and Red vector phase are adjusted proper position as shown in Fig.5-14, 5-15, 5-16 and Table 5-25.
- First, adjust the Burst Level and Phase according to following formula.
  DATA of 0B7(**12.1**) = DATA of 3CA (**12.3**)
  DATA of 0B8 (**12.2**) = DATA of 3CB (**12.4**)
  Note the DATA at each adjustment step.
- Then adjust the Red Vector Phase according to following formula.
  DATA of 0B7 (**12.1**) → Current DATA + α
  DATA of 0B8 (**12.2**) → Current DATA – α
  DATA of 3CA (**12.3**) → Current DATA – α
  DATA of 3CB (**12.4**) → Current DATA + α

12.1. Burst Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0B7)** **Main Board**

- The menu as shown in Table 5-17 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


12.1. BURST LEVEL
     VIDEO OUT  300 mV  + - 10mV


 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0B7
<DATA>        : 14 - 14

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-17

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Set the Mode Switch of the Vectorscope to NTSC mode.
- Adjust data with the **ARROW** keys so that the Burst level and Phase are proper position as shown in Fig. 5-15.
- Note the DATA for step **12.3**.
- Press the **ENTER** key for next adjustment.

12.2. Burst Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0B8)** **Main Board**

- The menu as shown in Table 5-18 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


12.2. BURST LEVEL
     VIDEO OUT  300 mV  + - 10mV


 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0B8
<DATA>        : 55 - 55

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-18

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the Burst level and Phase are proper position as shown in Fig. 5-15.
- Note the DATA for step **12.4**.
- Press the **ENTER** key for next adjustment.

12.3. Burst Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM3 (3CA)** **Main Board**

- The menu as shown in Table 5-19 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


12.3. BURST LEVEL
     VIDEO OUT  300 mV  + - 10mV


 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM3
<ADDRESS>     : 3CA
<DATA>        : 14 - 14

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-19

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes same value of adjustment step **12.1**.
- Press the **ENTER** key for next adjustment.

12.4. Burst Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM3 (3CB)** **Main Board**

- The menu as shown in Table 5-20 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************* EVR ********************** PAL


12.4. BURST LEVEL
     VIDEO OUT  300 mV + - 10mV


  ************************************************
<DEVICE>      : RAM3
<ADDRESS>     : 3CB
<DATA>        : 55 - 55

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-20

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes same value of adjustment step **12.2**.
- Press the **ENTER** key and **ROLL DOWN** Key until menu as shown in Table 5-21 will be displayed.

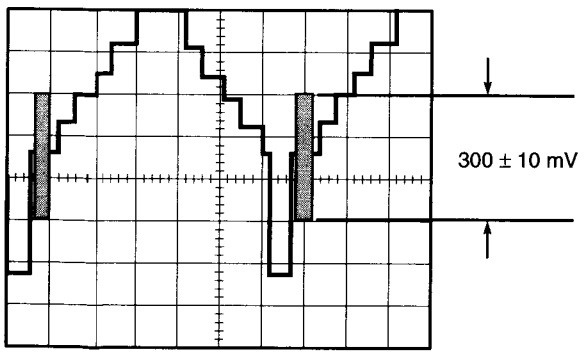


Fig. 5-14

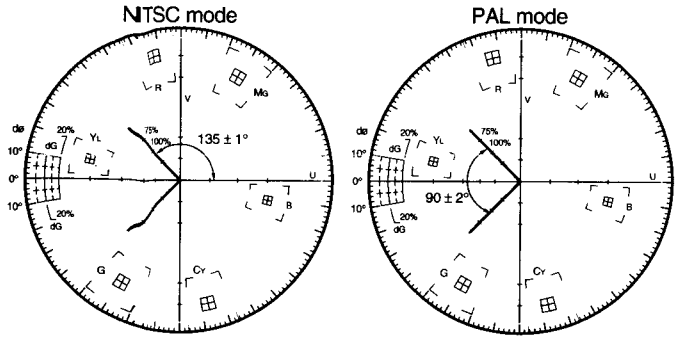


Fig. 5-15

12.1. Burst Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0B7)** **Main Board**

- The menu as shown in Table 5-21 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************* EVR ********************** PAL


12.1. BURST LEVEL
     VIDEO OUT  300 mV + - 10mV


  ************************************************
<DEVICE>      : RAM0
<ADDRESS>     : 0B7
<DATA>        : 15 - 15

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-21

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes +α from noted data.
- Press the **ENTER** key for next adjustment.

12.2. Burst Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0(0B8)** **Main Board**

- The menu as shown in Table 5-22 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
********************* EVR ********************** PAL


12.2. BURST LEVEL
     VIDEO OUT  300 mV + - 10mV


  ************************************************
<DEVICE>      : RAM0
<ADDRESS>     : 0B8
<DATA>        : 54 - 54

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-22

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes −α from noted data.
- Press the **ENTER** key for next adjustment.

12.3. Burst Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM3(3CA)** **Main Board**

- The menu as shown in Table 5-23 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


12.3. BURST LEVEL
     VIDEO OUT  300 mV  + - 10mV


   * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM3
<ADDRESS>     : 3CA
<DATA>        : 13 - 13

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-22

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes $-\alpha$ from noted data.
- Press the **ENTER** key for next adjustment.

12.4. Burst Level Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM3(3CB)** **Main Board**

- The menu as shown in Table 5-24 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


12.4. BURST LEVEL
     VIDEO OUT  300 mV  + - 10mV


   * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM3
<ADDRESS>     : 3CB
<DATA>        : 56 - 56

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-24

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes $+\alpha$ from noted data.
- Press the **ENTER** key and **ROLL DOWN** Key to confirm Burst Level, PHASE and Red Vector position are within the specification as shown in Fig. 5-14, 5-15 , 5-16 and Table 5-25.

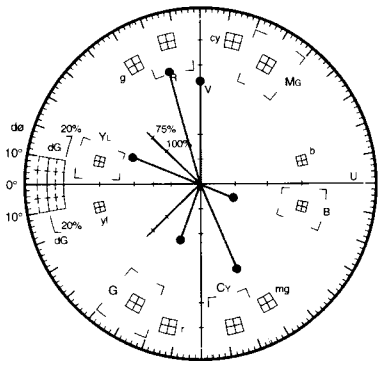


Fig. 5-16

	Red	Yellow
Phase	108 ± 2°	160 ± 5°
Gain	220 ± 5 %	100 ± 5 %

Table 5-25

- Repeat adjust from **12.1** to **12.4** until Burst Level, PHASE and Red Vector position are adjusted proper position.
- Press the **ENTER** key for next adjustment.

13.1. R White Balance 3200K Manual Offset Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0F4)** **Main Board**

- The menu as shown in Table 5-26 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


13.1. WB 3200K MANU OFFSET R
     VIDEO OUT  < = 20 mV


   * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0F4
<DATA>        : 97 - 97

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-26

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the White Chart.
- Set the Gain Control of the Vectorscope to maximum.
- Adjust data with the **ARROW** keys so that the vector position at the center of the vectrscope as shown in Fig.5-17.

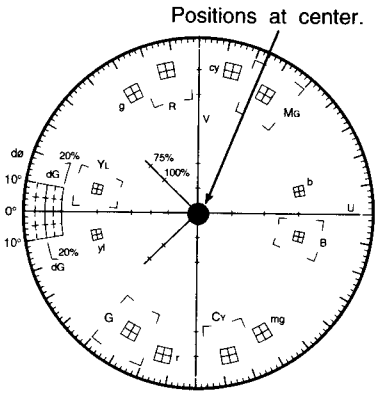


Fig. 5-17

- Press the **ENTER** key for next adjustment.

13.2. B White Balance 3200K Manual Offset Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0F5)** **Main Board**

- The menu as shown in Table 5-27 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


13.2. WB 3200K MANU OFFSET B
      VIDEO OUT  < = 20 mV



 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0F5
<DATA>        : C7 - C7

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-27

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the White Chart.
- Set the Gain Control of the Vectoscope to maximum.
- Adjust data with the **ARROW** keys so that the vector position at the center of the vectrscope as shown in Fig.5-18.

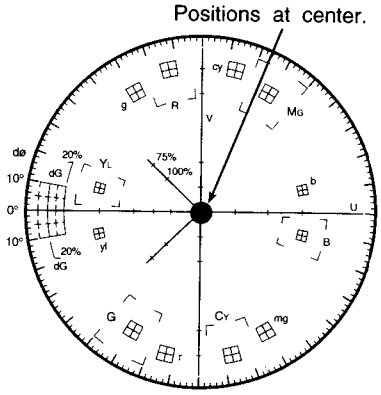


Fig. 5-18

- Repeat adjust steps **13.1** and **13.2** until vector positions at the center of the Vectorscope.
- Press the **ENTER** key for next adjustment.

14.1. R White Balance 6500K ATW Limit Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0FA)** **Main Board**

- The menu as shown in Table 5-28 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


14.1. WB 6500K ATW LIMIT R
      VIDEO OUT  < = 20 mV



 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0FA
<DATA>        : 57 - 57

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-28

- Aim the Camera at the White Chart.
- Change the Colour Temperature from the 3200K to 6500K by replace Colour Conversion Filter from W12 to C4.
- Set the Gain Control of the Vectoscope to maximum.
- Adjust data with the **ARROW** keys so that the vector position at the center of the vectrscope as shown in Fig.5-19.

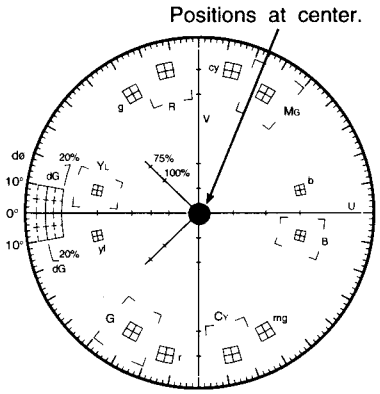


Fig. 5-19

- Press the **ENTER** key for next adjustment.

14.2. B White Balance 6500K ATW Limit Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0FB)** **Main Board**

- The menu as shown in Table 5-29 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


14.2. WB 6500K ATW LIMIT B
     VIDEO OUT  <=20 mV


 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0FB
<DATA>        : 61-61

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-29

- Keep the Colour Temperature at 6500K.
- Aim the Camera at the White Chart.
- Set the Gain Control of the Vectoscope to maximum.
- Adjust data with the **ARROW** keys so that the vector position at the center of the vectrscope as shown in Fig.5-20.

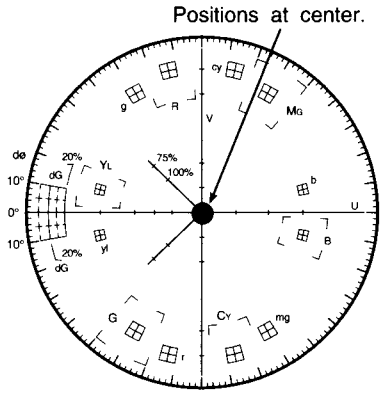


Fig. 5-20

- Repeat adjust steps **14.1** and **14.2** until vector positions at the center of the Vectorscope.
- Press the **ENTER** key for next adjustment.

15.1. 3200K R_Gain Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0F8)** **Main Board**

- The menu as shown in Table 5-30 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * PAL


15.1. 3200K R_GAIN
     VIDEO OUT


 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0F8
<DATA>        : 95 - 95

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
 LOAD (F1)     QUIT (F3)     SAVE (F5)
```

Table 5-30

- Aim the Camera at the Colour Chip Chart.
- Return the Colour Temperature from the 6500K to 3200K.
- Adjust data with the **ARROW** keys so that the Red gain becomes 220 ± 5%.
- Press the **ENTER** key for next adjustment.

Note: Chrominance phase and gain are adjusted to proper position as shown in Fig. 5-21 and Table 5-33.

15.2. 3200K B_Gain Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0F9)** **Main Board**

- The menu as shown in Table 5-31 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * PAL


15.2. 3200K B_GAIN
     VIDEO OUT


    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0F9
<DATA>        : 66 - 66

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-31

- Keep the Colour Temperature at 3200K.
- Adjust data with the **ARROW** keys so that the Yellow gain becomes 100 ± 5%.
- Press the **ENTER** key for next adjustment.

Note: Chrominance phase and gain are adjusted to proper position as shown in Fig. 5-21and Table 5-33.

15.3. 3200K Matrix Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0B8)** **Main Board**

- The menu as shown in Table 5-32 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * PAL


15.3. 3200K MATRIX
     VIDEO OUT


    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0B8
<DATA>        : 42 - 42

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-32

- Keep the Colour Temperature at 3200K.
- Adjust data with the **ARROW** keys so that the Red vector phase becomes 108 ± 2°.
- Repeat adjust from steps **15.1** to **15.3** until both chrominance phase and gain are adjusted to proper position as shown in Fig. 5-21 and Table 5-33.

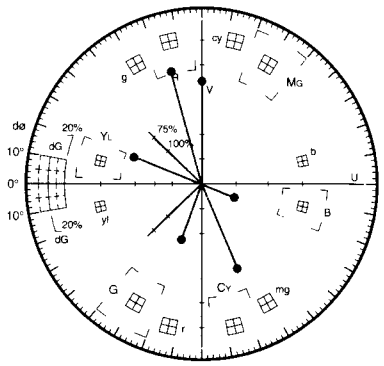


Fig. 5-21

	Red	Yellow
Phase	108 ± 2°	160 ± 5°
Gain	220 ± 5%	100 ± 5%

Table 5-33

- Press the **ENTER** key for next adjustment.

16.1. 5100K_R Gain Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0DC)** **Main Board**

- The menu as shown in Table 5-34 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * PAL


16.1. 5100K R_GAIN
     VIDEO OUT


    * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
<DEVICE>      : RAM0
<ADDRESS>     : 0DC
<DATA>        : 3F - 3F

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-34

- Aim the Camera at the Colour Chip Chart.
- Change the Colour Temperature from the 3200K to 5100K.
- Adjust data with the **ARROW** keys so that the Red Gain becomes 220 ± 5%.
- Press the **ENTER** key for next adjustment.

16.2. 5100K_B Gain Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (0DE)** **Main Board**

- The menu as shown in Table 5-35 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * * * PAL


16.2. 5100K B_GAIN
     VIDEO OUT


   ************************************************************
<DEVICE>      : RAM0
<ADDRESS>     : 0DE
<DATA>        : DB-DB

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-35

- Keep the Colour Temperature at 5100K.
- Adjust data with the **ARROW** keys so that the Yellow Gain becomes 100 ± 5 %.
- Repeat adjust from steps **16.1** and **16.2** until both chrominance phase and gain are adjusted to proper position as shown in Fig. 5-22 and Table 5-36.

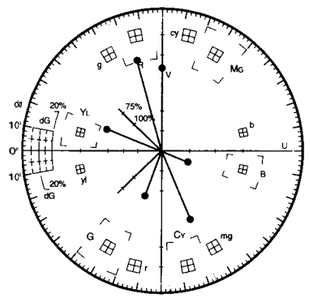


Fig. 5-22

	Red	Yellow
Phase	108 ± 2°	160 ± 5°
Gain	220 ± 5%	100 ± 5%

Table 5-36

- Press the **ENTER** key for next adjustment.

17. Highlight Chroma Clip Adjustment

Test Point: **CN5 (Video Output Connector)** **I/F Board**
Adjust: **RAM0 (09F)** **Main Board**

- The menu as shown in Table 5-37 will be displayed.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * * * PAL


17. HIGHLIGHT CHROMA
     VIDEO OUT


   ************************************************************
<DEVICE>      : RAM0
<ADDRESS>     : 09F
<DATA>        : C4 - C4

<MESSAGE>     :


<INSTRUCTION> ADJUST DATA BY ARROW-KEY, ROLLDOWN : PREVIOUS ITEM
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-37

- Aim the Camera at the White Chart.
- Return the Colour Temparature from the 5100K to 3200K.
- Adjust data with the **ARROW** keys so that the false chrominance level becomes minimum as shown in Fig. 5-23.

Note: The Data of 09F should be adjust from FF, the first minimum point of the false chrominance signal is as adjusting point.

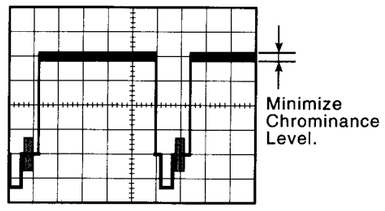


Fig. 5-23

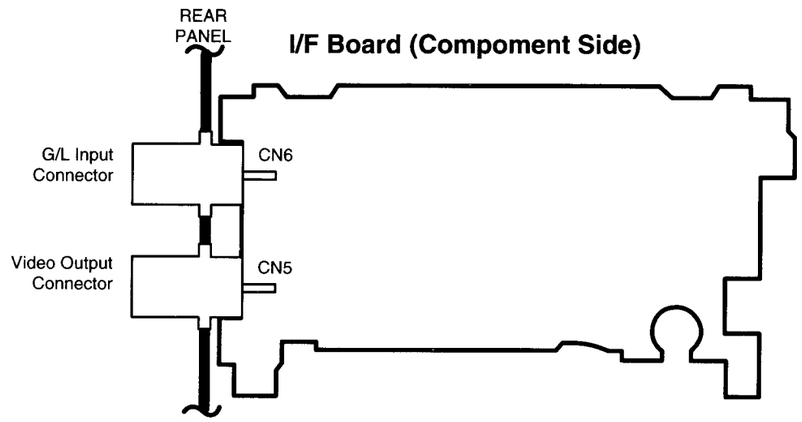
- After completing of the adjustment, press the **QUIT (F3)** key, then the menu as shown in Table 5-38 will be displayed

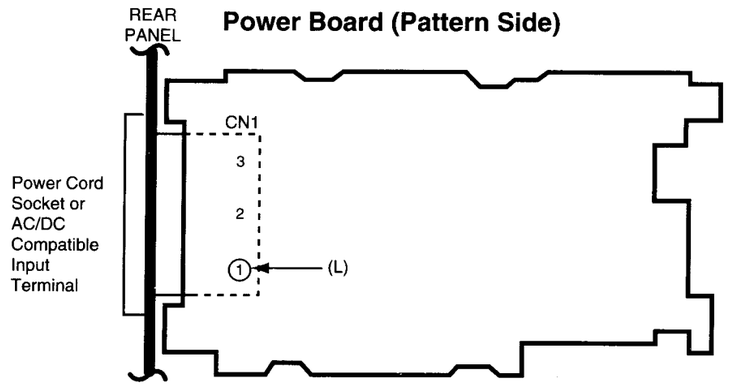
```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP650 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * EVR * * * * * * * * * * * * * * * * * * * * * * PAL


17. HIGHLIGHT CHROMA
     VIDEO OUT


   ************************************************************
<DEVICE>      : RAM0
<ADDRESS>     : 09F
<DATA>        : C4 - C4

<MESSAGE>     :


<SAVE CAMERA DATA TO FILE : * * * .EVR? Y/N >
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

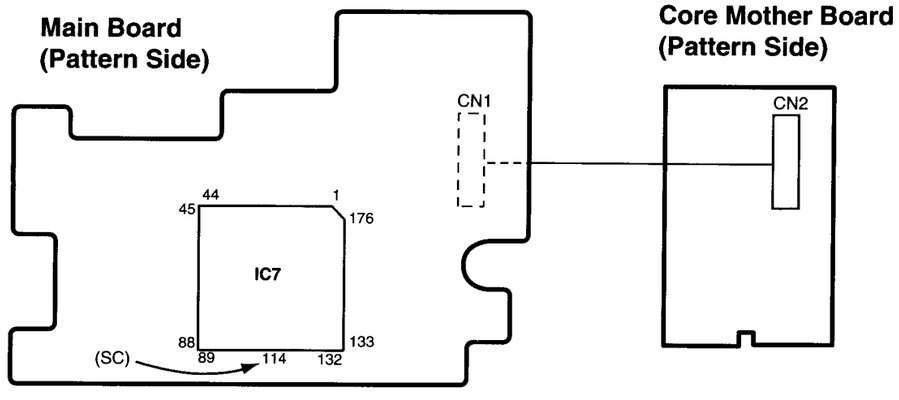
Table 5-38

- Press the **N** key, and then press the **ENTER** key to finish of this adjustment procedure.

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

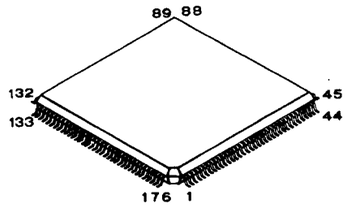






APPEARANCE OF IC, TRANSISTOR AND DIODE

YWMN673521



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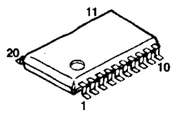
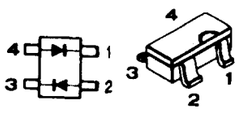
YWD6462GS905

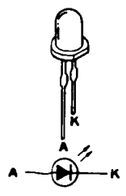


YWUC2843NU

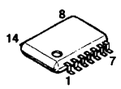
MA726



YWS5LC22VR

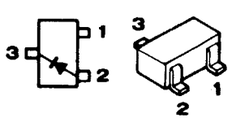


YWSN74LVC04Y

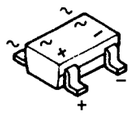


TA76431S

YWAD121



DF06S



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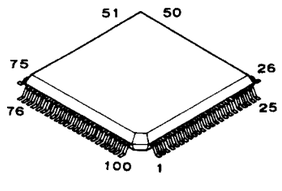
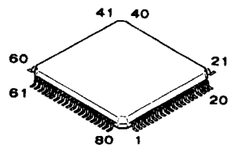
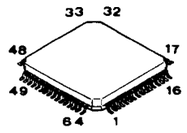
YWTC7W74F



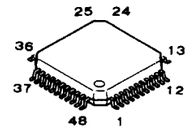
YWT93C4F9041
YWUPD97047GC



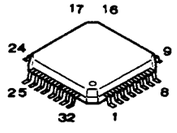
MN67353



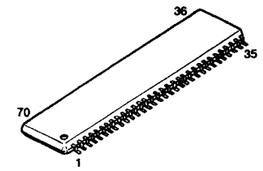
MN5278C



AN2108FHP
AN9DE01F

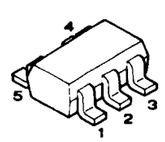


YWTDA8766GCS

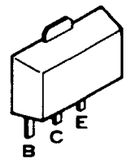


YWZA4035H

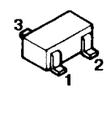
YWTC7S04F
YWTC7S04FUL
YWTC7S08FUL
YWTC7S32F
TC7SH00FUL



2SD874A-RD



MN13821
XC62AP4702MR



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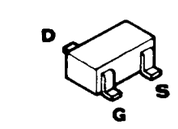
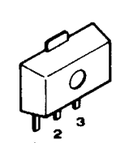
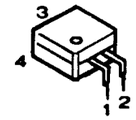


S81233PGT1



PC817



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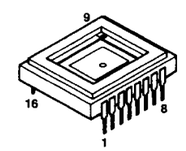
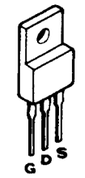
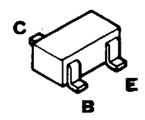


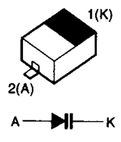
2SK2520



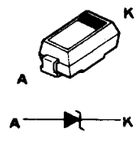
2SA1774
2SA1037
2SB1218A-QS
2SB1219-QRS
2SC2412-QRS
2SC4617
2SC4619
2SD1819-QRS
2SD1820-QRS



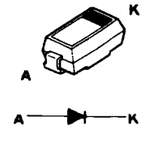
HVU350TRF
YWHVU359TRF



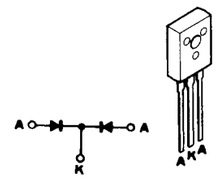
YWSK2012
YWSC80206L



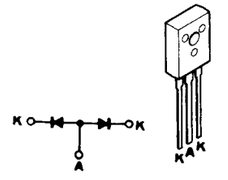
MA8091HTX
MA8150MTX



D10SC6M



D10SC6MR



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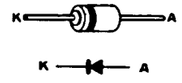
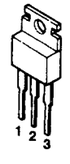


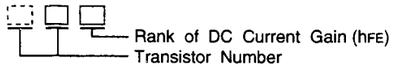
MIP160



CHIP COMPONENTS

1. Chip Transistor

The transistor number is indicated on the top surface of the chip transistor using two alphabet letters or one numerical number and two alphabet letters.



Transistor Number

(Chip Transistor)

Letter	Transistor No.	Letter	Transistor No.
A	2SB709	X	2SD602A
B	2SB709A	Y	2SD601
C	2SB710	Z	2SD601A
D	2SB710A	1A	2SB799
E	2SA1022	1B	2SB814
F	2SA1034	1C	2SB902
H	2SA1035	1F	2SK321
I	2SB792	1K	2SK316
K	2SC2778	1L	2SK247
P	2SD814	1M	2SJ84
Q	2SD813	1N	2SK199
R	2SC2480	1O	2SK198
S	2SC2405	1T	2SC3077
T	2SC2406	1X	2SC2845
U	2SC2404	1Z	2SD1030
V	2SC2295	2B	2SK374
W	2SD602	2C	2SK116
BQ	2SB766A	UMT	2SC4081

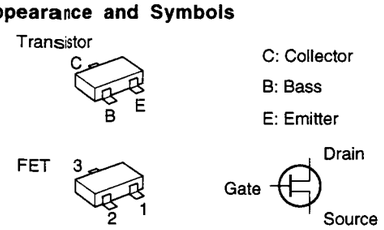
(Small Chip Transistor) (Pair Transistor)

Letter	Transistor No.
A	2SB1218
B	2SB1218A
D	2SB1219A
U	2SC3931
W	2SD1820
X	2SD1820A
Y	2SD1819
E3	2SA1226
OS	2SB1219
UC	2SA1532
YU	2SC3938

Letter	Transistor No.	Letter	Transistor No.
5R	XN1501	5H	XP4501
7S	XN1601	5C	XP4601
5H	XN4501	5H	XP4501
5C	XN4601	5L	XP5501
5L	XN5501	4N	XP5601
4N	XN5601	7S	XP6501
5N	XN6501	7W	XP6435
7W	XN6435	7F	XP6534
7F	XN6534	X1	UMX1
5R	XP1501	Z1	UMZ1
7S	XP1601		

Example WQ → 2SD602-Q
YQ → 2SD601-Q
1SB → 2SB814-S

Appearance and Symbols



	1	2	3
Except 2SK199	Drain	Source	Gate
2SK199	Gate	Drain	Source

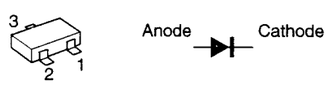
2. Chip Diode

The diode number is indicated on the to surface of the chip diode using two alphabet letters.

Diode Number

	1	2	3
MA28/MA28W/MA28T	–	Anode	Cathode
MA151K/MA152K	–	Anode	Cathode
MA151A/MA152A	–	Cathode	Anode
MA151WK/MA152WK	Anode	Anode	Cathode
MA151WA/MA152WA	Cathode	Cathode	Anode
MA153	Cathode	Anode	Common
MA141K	–	Anode	Cathode
MA143	Anode	Cathode	Common
MA3062	Anode	–	Cathode
RD421D	Anode	–	Cathode

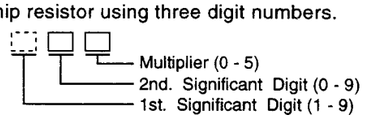
Appearance and Symbol



	1	2	3
MA28/MA28W/MA28T	–	Anode	Cathode
MA151K/MA152K	–	Anode	Cathode
MA151A/MA152A	–	Cathode	Anode
MA151WK/MA152WK	Anode	Anode	Cathode
MA151WA/MA152WA	Cathode	Cathode	Anode
MA153	Cathode	Anode	Common
MA141K	–	Anode	Cathode
MA143	Anode	Cathode	Common
MA3062	Anode	–	Cathode
RD421D	Anode	–	Cathode

3. Chip Resistor

The resistor value is indicated on the bottom surface of the chip resistor using three digit numbers.



Example:

330 → 33 x 100 = 33 Ω
561 → 56 x 101 = 560 Ω
123 → 12 x 103 = 12 kΩ

Note: Zero ohm resistor (jumper chip) is colored red or green.

4. Chip Capacitor

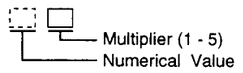
The capacitive value of replacement chip capacitor is indicated on the bottom surface. Original parts do not have value indication.

If the capacitive value is less than 100 pF, the value will be indicated by one or two digit number expressing the capacity directly in pF.

Example:

0.5 → 0.5 pF 2.5 → 2.5 pF
.75 → 0.75 pF 33 → 33 pF
1 → 1 pF 82 → 82 pF

If the capacitive value is 100 pF or greater, the value will be indicated by an alpha-numeric code. The letter precedes the number and expresses a numerical value to be multiplied by the number which follows.



Numerical Value

Letter	Value	Letter	Value
A	10	N	33
B	11	P	36
C	12	Q	39
D	13	R	43
E	15	S	47
F	16	T	51
G	18	U	56
H	20	V	62
J	22	W	68
K	24	X	75
L	27	Y	82
M	30	Z	91

*** Letters I and O are not used.**

Example: A1 → $10 \times 10^1 = 100$ pF
N2 → $33 \times 10^2 = 3300$ pF
S3 → $47 \times 10^3 = 47000$ pF

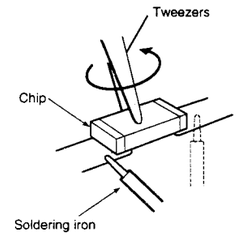
5. Precautions in replacing the chip component

1. Make sure that the unit is turned OFF when replacing the chip.
2. Use tweezers to prevent any damage to the chip surface.
3. Do not re-use the chips after removal.
4. Do not rub the electrode of chips.
5. Do not subject the chips to excessive stress.
6. It is recommended that a pencil-type soldering iron to be used.
7. The solder whose diameter is less than 0.5 mm is recommended.
8. Do not heat the chip beyond 3 second.
9. Maintain temperature control under 260°C (500°F) when soldering.

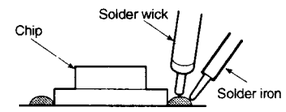
5-1. Removal (Transistor, Diode, Resistoe and Capacitor)

1. Add the solder to both ends of the chip (three leads for chip transistor).
2. While attaching the soldering iron to both ends of the chip (three leads for chip transistor) as shown below, remove the chip by turning with tweezere.

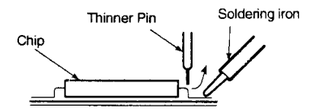
Note: Be careful not to damage other chips.



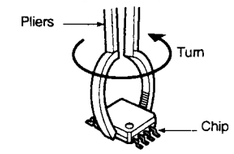
1. Add the solder wick and soldering iron to each lead of the IC and remove solder.



2. Add the soldering iron to each lead of the IC and left each lead of the IC using thinner pin.

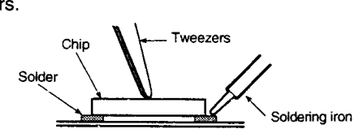


3. Remove IC turning it with pliers.

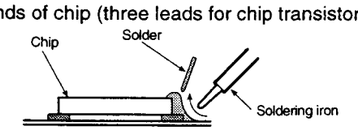


5-2. Mounting

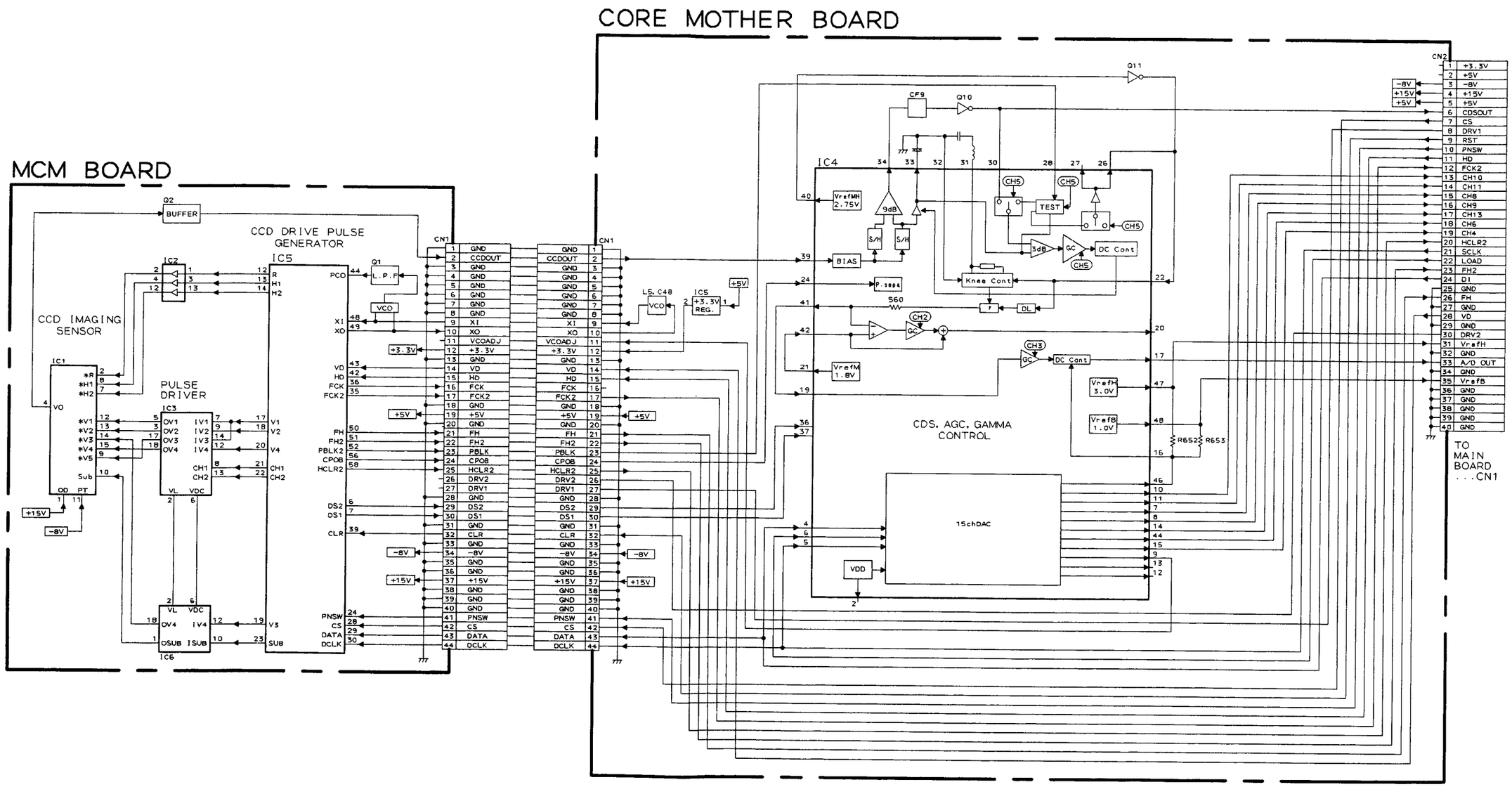
1. Place the solder thinly on the chip mounting foil.
2. Solder the chip temporarilu while holding the chip with the tweezers.



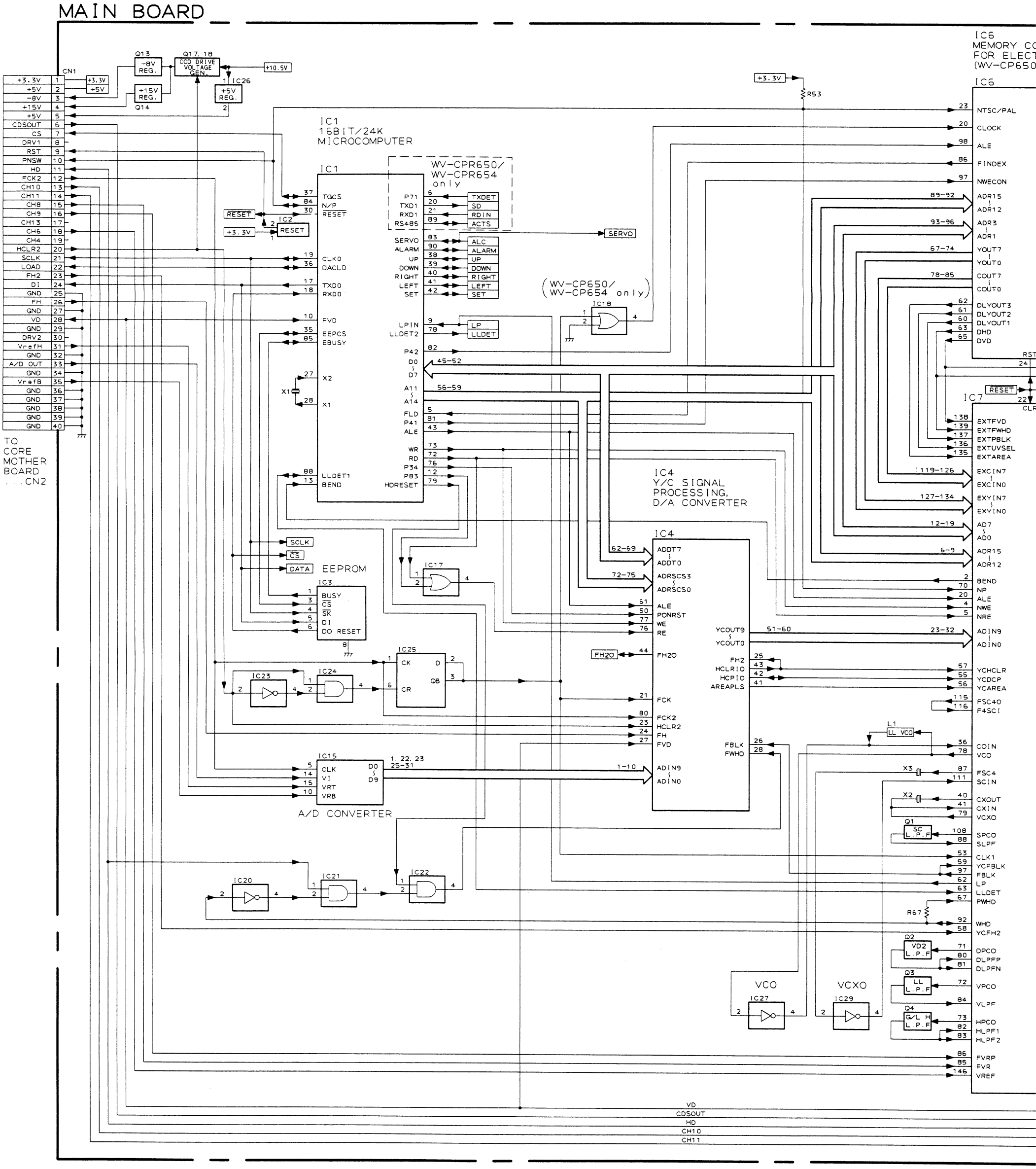
3. Solder both ends of chip (three leads for chip transistor).



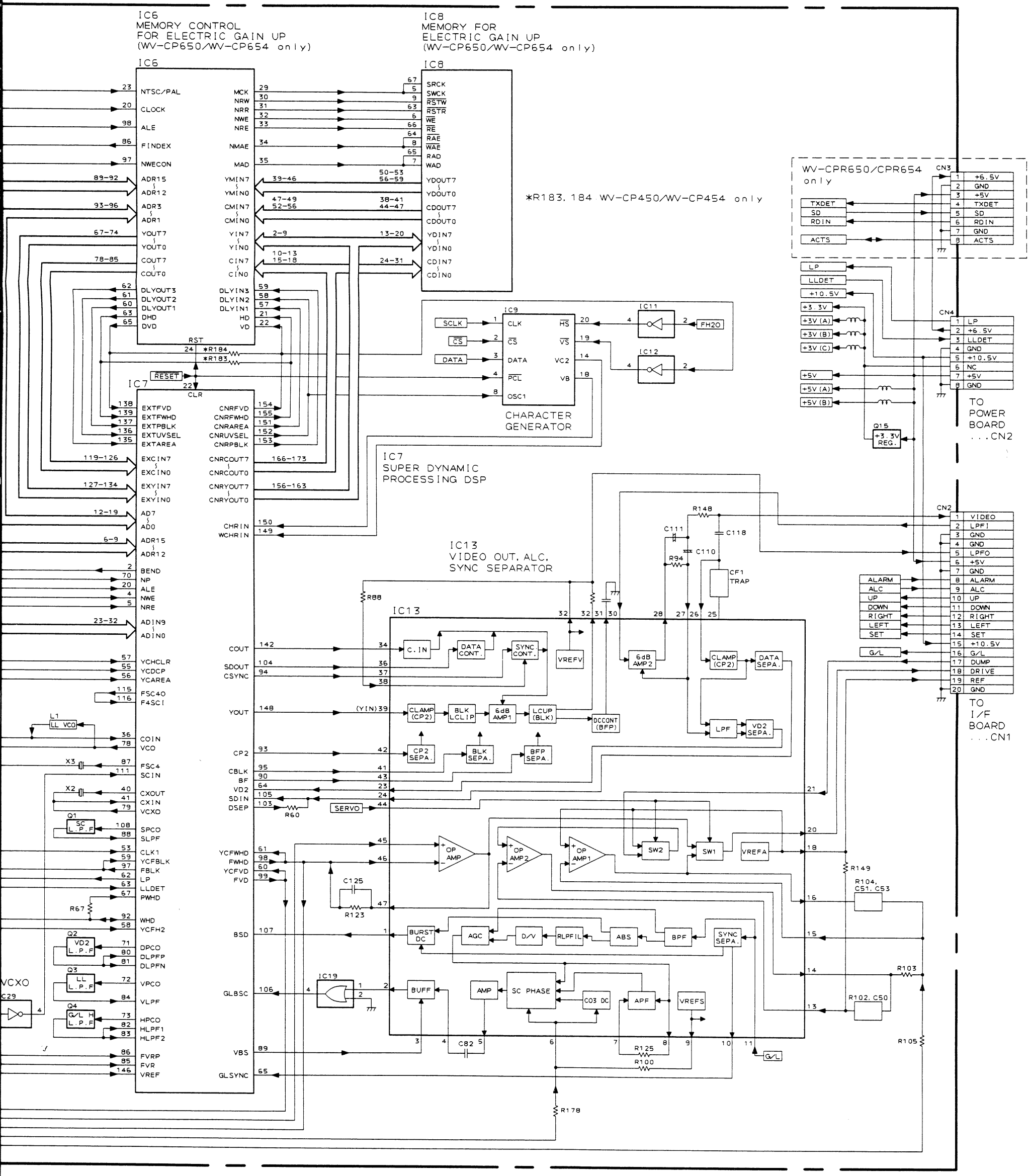
BLOCK DIAGRAM OF MCM BOARD / CORE MOTHER BOARD



BLOCK DIAGRAM OF MA



K DIAGRAM OF MAIN BOARD



MAIN BOARD

*marked parts are shown in follows.

	IC6	IC8	IC18	R12	R18	R21	R35	R71	R72	R171	R183	R184	Z1	Z2	Z3	Z4	C2	C7	C10	C11	C57	L2
WV-CP650/WV-CP654	MOUNT	MOUNT	MOUNT	0R00	0R00	0R00	OPEN	472	752	0R00	OPEN	OPEN	751	751	751	751	104	104	104	104	106	8R2
WV-CP450/WV-CP454	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	0R00	752	102	OPEN	0R00	0R00	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN

TO CORE MOTHER BOARD ...CN2 (VIA FLEXIBLE BOARD)

CCD DRIVE VOLTAGE GENERATOR

IC1 MICROCOMPUTER

*IC6 MEMORY CONTROLLER

IC7 SUPER DYNAMIC PROCESSING DSP

IC4 Y/C SIGNAL PROCESSING, D/A CONVERTER

IC15

A/D CONVERTER

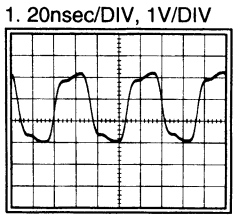
EEPROM

RESET

PAL 908FH

<Waveform> **MAIN BORD**

1. 20nsec/DIV, 1V/DIV



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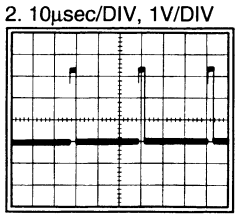
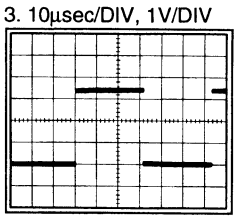


3. 10µsec/DIV, 1V/DIV



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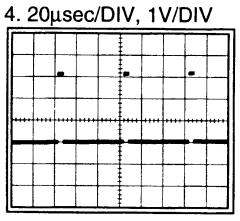

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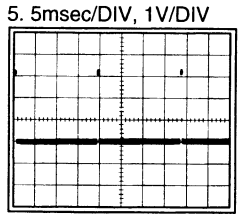

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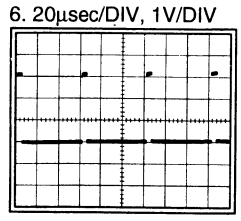
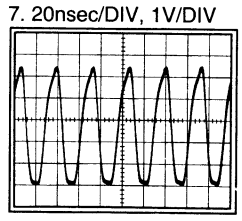
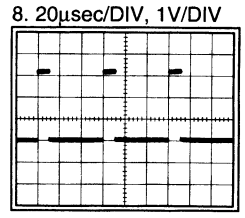


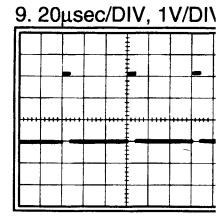
7. 20nsec/DIV, 1V/DIV



8. 20µsec/DIV, 1V/DIV



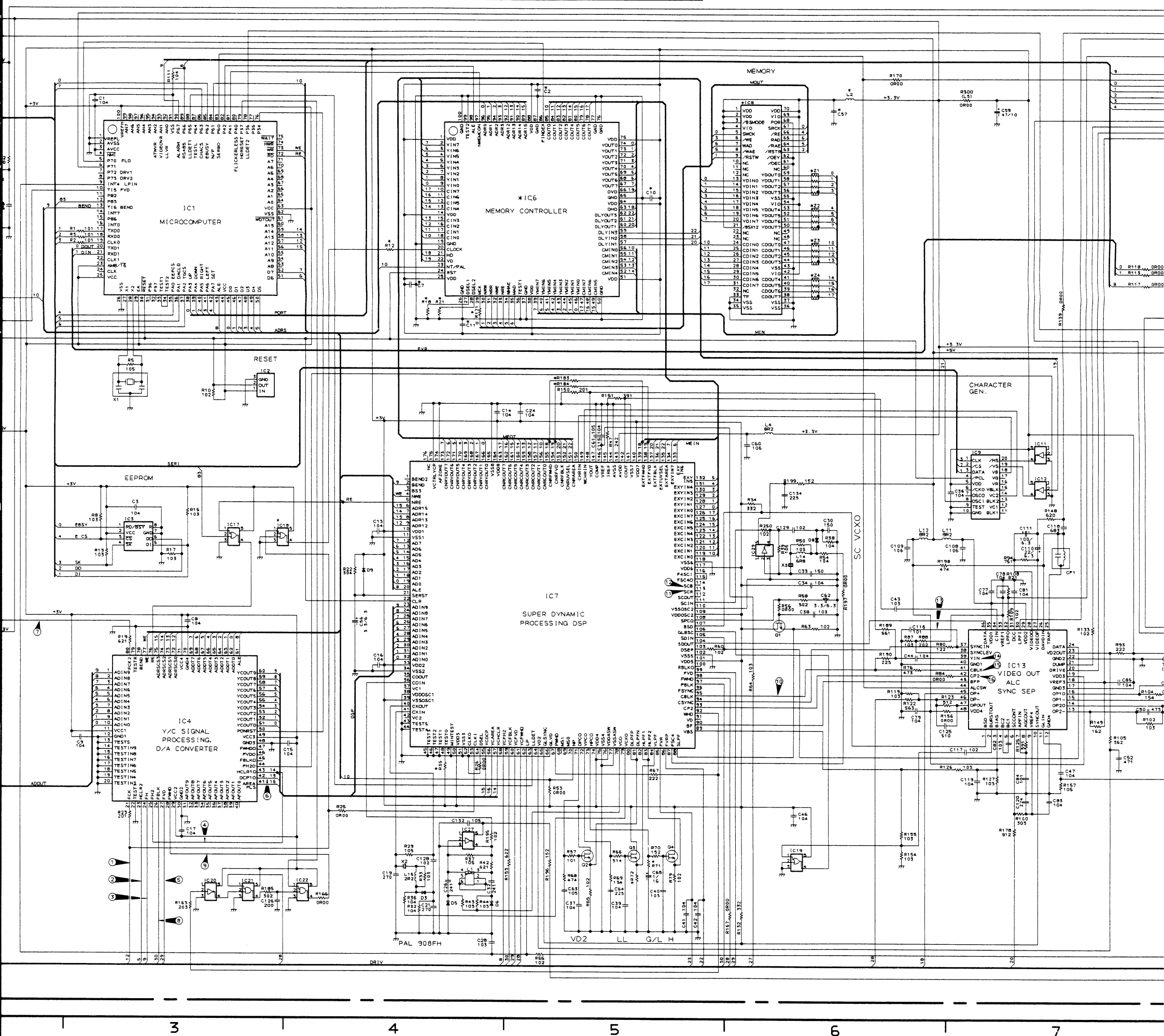
9. 20µsec/DIV, 1V/DIV

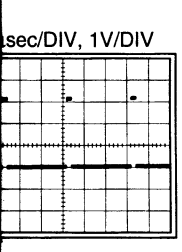


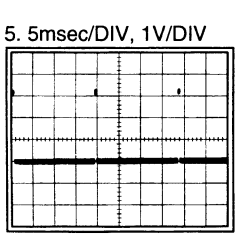
SCHEMATIC DIAGRAM OF MAIN BOARD

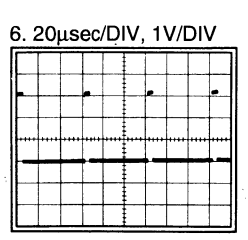
*marked parts are shown in follows.

	IC6	IC8	IC18	R12	R18	R21	R35	R71	R72	R171	R183	R184	Z1	Z2	Z3	Z4	C2	C7	C10	C11	C57	L2
WV-CP650/WV-CP654	MOUNT	MOUNT	MOUNT	0R00	0R00	0R00	OPEN	472	752	0R00	OPEN	OPEN	751	751	751	751	104	104	104	104	106	8R2
WV-CP450/WV-CP454	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	0R00	752	102	OPEN	0R00	0R00	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN	OPEN




5. 5msec/DIV, 1V/DIV


6. 20µsec/DIV, 1V/DIV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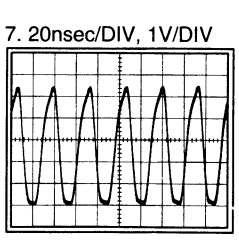
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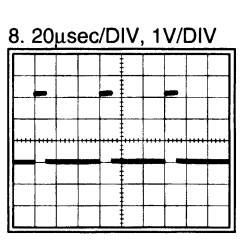
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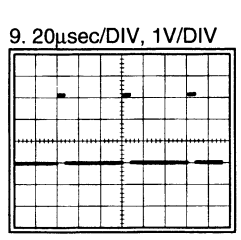
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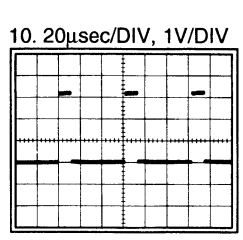
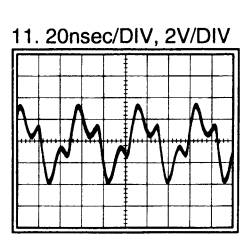
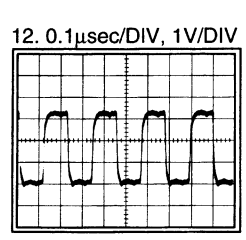
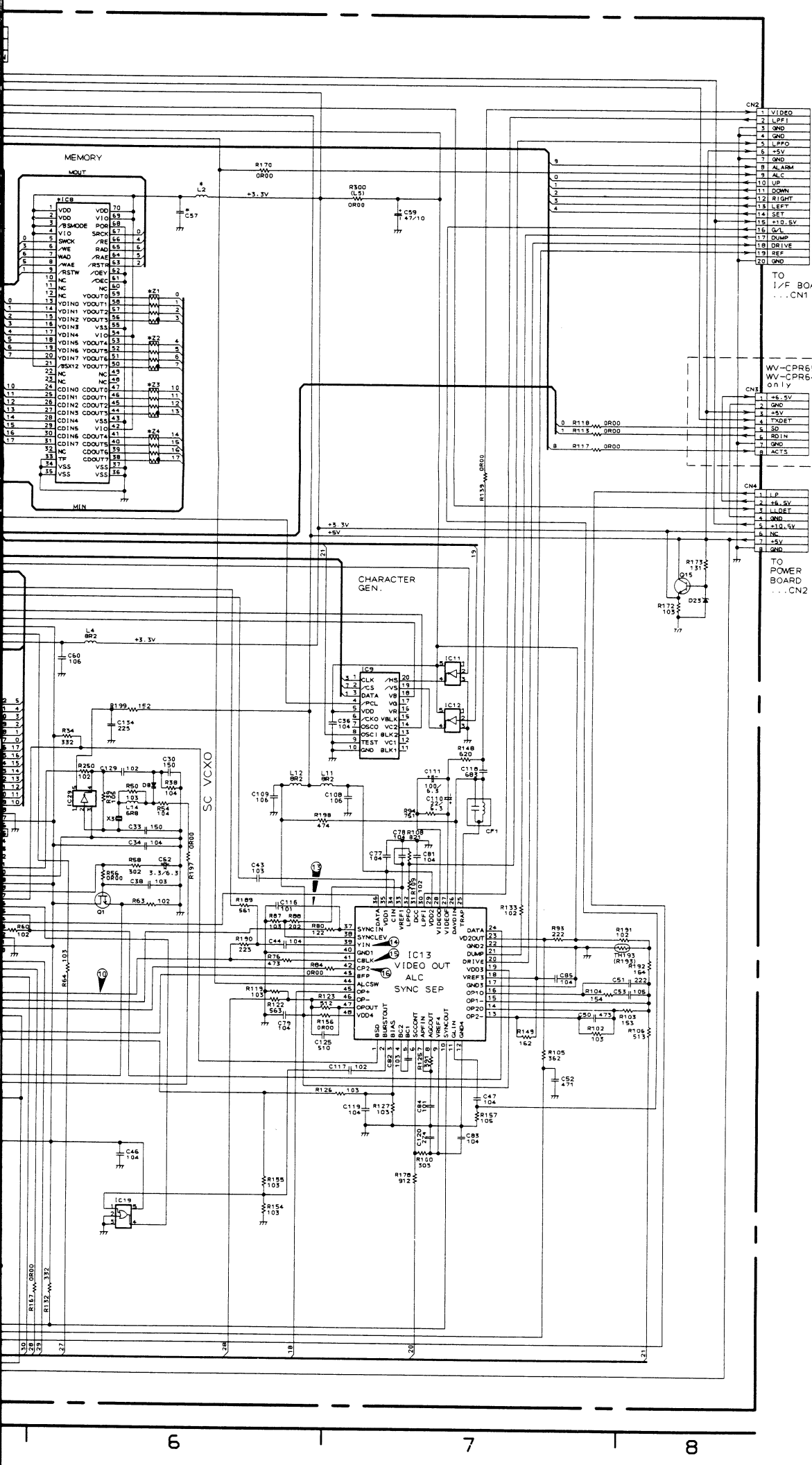

11. 20nsec/DIV, 2V/DIV


12. 0.1µsec/DIV, 1V/DIV


13. 2

AM OF MAIN BOARD



<Index>

MAIN BOARD

IC1	D3	Q1	B6
IC2	C3	Q2	A5
IC3	C3	Q3	A5
IC4	B3	Q4	A5
IC6	D5	Q13	D2
IC7	B5	Q14	D2
IC8	E6	Q15	C8
IC9	C7	Q17	D2
IC11	C7	Q18	D2
IC12	C7	D3	A4
IC13	B7	D5	A4
IC15	B2	D6	A4
IC17	C3	D8	C6
IC18	C3	D9	C4
IC19	A6	D17	D2
IC20	A3	D18	D1
IC21	A3	D19	D1
IC22	A4	D20	D2
IC23	C1	D21	D2
IC24	C2	D22	D2
IC25	C2	D23	C8
IC26	E1		
IC27	A4		
IC29	C6		

Note: **The value indicated in the schematic diagram should be read as follows:**

□ □ □
- Multiplier (0 - 5)
- 2nd. Significant Digit (0 - 9)
- 1st. Siginificant Digit (1 - 9)

<Example>

For Resistor:

330 → 33 x 10^0 = 33 Ω
561 → 56 x 10^1 = 560 Ω
123 → 12 x 10^3 = 12k Ω
0R00 = 0 Ω

For Capacitor:

820 → 82 x 10^0 = 82 pF
102 → 10 x 10^2 = 1000 pF = 0.001 µF
104 → 10 x 10^4 = 100000 pF = 0.1 µF

The suffix attached to capacitance indicates a type of capacitor.

<Voltage>

MAIN BOARD

	IC1	IC4	IC7		IC1	IC4	IC7		IC1	IC7		IC7
Pin 1	0	0.2	1.1	Pin 45	1.5	0.8	0	Pin 89	0	0	Pin133	0
2	0	0.6	1.3	46	1.2	0	0	90	0	0	134	0
3	3.3	0.4	3.3	47	1.0	0.5	0	91	0	0	135	0
4	3.3	1.9	3.3	48	1.0	0	3.3	92	0.9	0.5	136	0
5	3.3	1.1	3.3	49	1.6	3.3	0	93	0.9	0	137	0
6	3.3	1.1	0.4	50	1.3	3.3	3.3	94	0.9	3.0	138	0
7	0	1.5	0.4	51	1.2	1.5	0	95	0.8	0.8	139	0.5
8	0	1.4	0	52	1.2	1.5	1.6	96	0.8	3.0	140	3.3
9	0	1.3	0.6	53	0.6	1.5	1.6	97	1.0	0.8	141	0
10	0	1.4	3.3	54	2.1	1.6	0	98	1.0	0.5	142	1.1
11	0.4	3.3	0	55	0.5	1.5	0	99	1.0	0	143	3.3
12	2.9	0	1.2	56	0.4	1.6	0	100	3.3	0.8	144	0
13	1.1	0	1.2	57	0.6	1.5	0.3	101		3.3	145	1.7
14	3.3	0	1.2	58	0	1.5	1.6	102		0	146	1.7
15	3.3	0	1.5	59	0.4	1.4	0.8	103		0	147	2.0
16	3.3	0	1.0	60	2.5	0	0	104		0	148	0.5
17	3.3	0	1.0	61	3.3	0.2	0.5	105		0	149	0
18	0.3	0	1.4	62	0	1.3	0	106		0	150	0
19	3.3	0	1.4	63	3.3	1.4	0	107		0	151	0
20	3.3	0	0.2	64	0	1.1	3.3	108		0.2	152	0
21	3.3	1.6	3.2	65	1.2	1.2	0	109		3.3	153	1.5
22	3.3	0	3.3	66	1.3	1.7	0	110		0	154	0
23	3.3	0.3	0.3	67	1.3	1.0	0.5	111		1.6	155	0.5
24	1.2	1.6	1.2	68	1.7	1.1	0	112		1.6	156	1.6
25	3.3	0.3	1.7	69	1.3	1.2	0	113		1.7	157	1.6
26	0	0.8	1.6	70	1.3	0	3.3	114		1.5	158	1.6
27	1.4	0	1.6	71	1.7	3.3	0	115		1.5	159	1.3
28	3.3	0.4	1.6	72	3.3	0.6	0	116		1.5	160	1.4
29	3.3	3.3	1.6	73	3.3	0.2	1.5	117		3.3	161	1.6
30	1.0	0	1.5	74	3.3	0.9	3.3	118		0	162	1.6
31	1.0	0	1.5	75	3.3	0.4	0	119		0	163	1.6
32	0.6	0	1.5	76	3.3	3.3	3.3	120		0	164	3.3
33	1.5	1.2	3.3	77	3.3	3.3	0	121		0	165	0
34	1.5	1.6	0	78	0	0.6	1.5	122		0	166	1.5
35	3.3	1.6	3.3	79	3.3	0.4	1.9	123		0	167	1.5
36	0	1.7	0	80	0	1.6	0.8	124		0	168	1.6
37	3.3	1.6	0	81	3.3		0.8	125		0	169	1.4
38	0	1.6	0	82	0		1.9	126		0	170	1.4
39	0	1.5	3.3	83	0		1.9	127		0	171	1.5
40	0	1.5	1.7	84	3.3		0.7	128		0	172	1.8
41	0	0	1.6	85	3.3		1.8	129		0	173	1.2
42	0	0	3.3	86	3.3		1.9	130		0	174	0
43	0.2	0.3	0	87	3.3		1.9	131		0	175	0
44	3.3	0.3	0	88	0		0.8	132		0	176	0.2

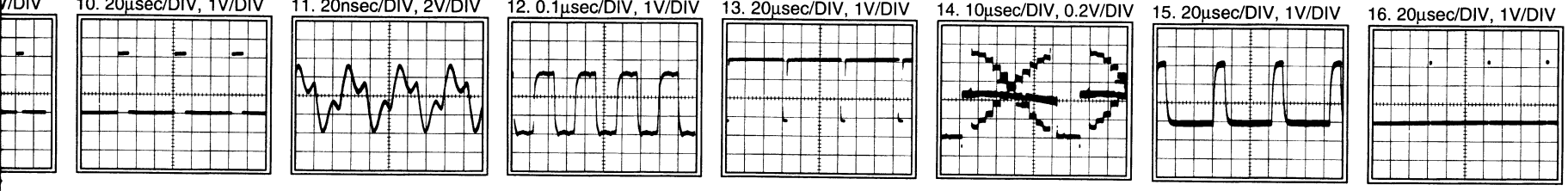
	IC2	IC26	IC11	IC12	IC17	IC19	IC20	IC21	IC22	IC23	IC24	IC3	IC25
Pin 1	3.3	6.2	0	0	3.3	0	0.4	0.5	3.3	1.1	0.3	3.3	1.6
2	3.3	4.7	0.2	0	2.9	0	0.5	2.8	0.6	0.3	2.9	3.3	1.6
3	0	0	0	0	0	0	0	0	0	0	0	3.3	1.6
4			3.0	3.2	3.3	0	2.8	0.4	0.4	2.9	3.3	3.3	0
5			3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	1.7
6												0.3	3.3
7												0	3.3
8												0	3.3

	IC9
Pin 1	3.3
2	3.3
3	3.3
4	3.3
5	3.3
6	0
7	0
8	1.5
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	3.2
20	3.1

	IC13	IC15		IC13	IC15		IC13
Pin 1	0	0	Pin 17	0	0.6	Pin 33	2.0
2	0	3.3	18	2.1	3.3	34	2.0
3	0	0	19	5.0	0	35	5.0
4	0.8	3.3	20	2.1	3.3	36	0
5	2.5	1.6	21	2.1	0	37	3.1
6	2.0	0	22	0	1.4	38	1.7
7	2.0	3.3	23	3.3	1.3	39	2.5
8	2.0	0.7	24	0	0.5	40	0
9	2.0	0	25	2.5	1.3	41	0.8
10	0	0.9	26	2.5	1.6	42	0
11	2.0	1.9	27	2.9	1.2	43	0
12	0	0.5	28	2.9	1.4	44	0
13	2.0	0.5	29	5.0	2.0	45	1.1
14	2.0	1.3	30	2.4	0.6	46	1.1
15	2.0	2.8	31	3.2	0.6	47	1.8
16	2.4	0	32	3.0	0.7	48	5.0

	S	G	D
Q 1	0.7	0	3.3
2	0.7	0	3.3
3	0.7	0	3.3
4	1.8	1.4	3.3

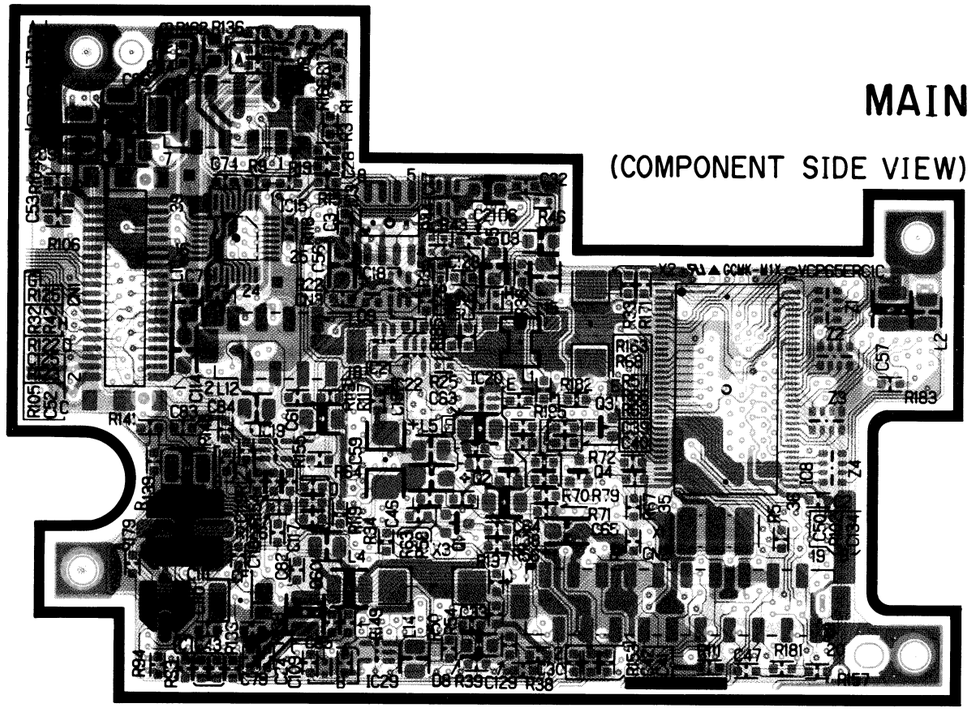
	B	C	E
Q 13	−0.4	8.3	0
14	9.0	8.3	9.5
15	4.0	5.1	3.3
17	0.4	9.0	0.9
18	0.4	0	0.9



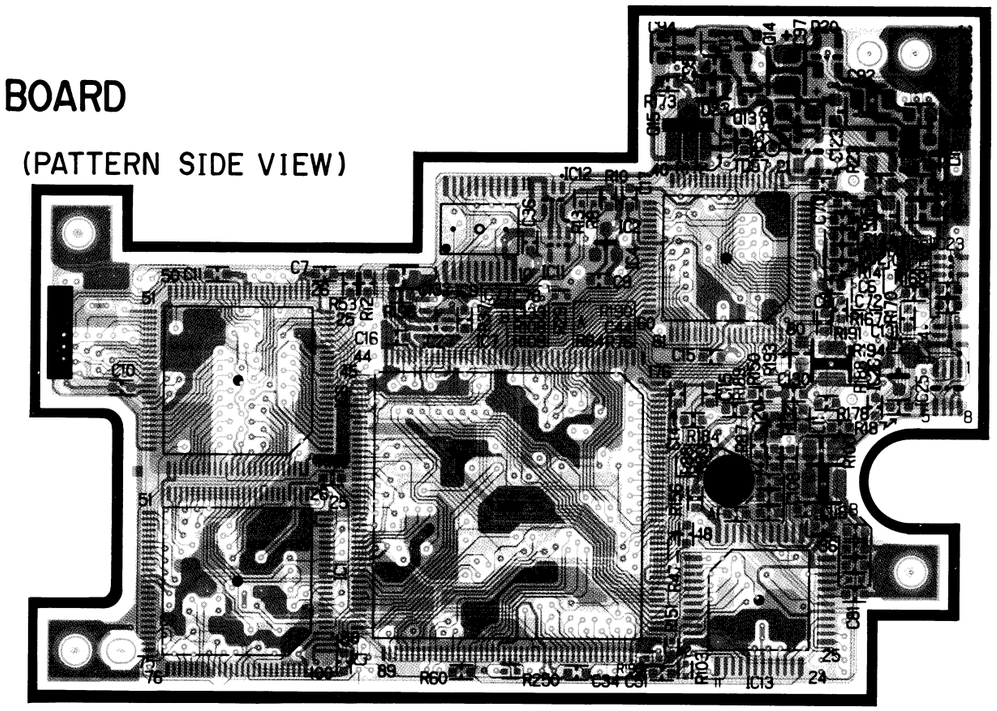
CONDUCTOR VIEW OF MAIN BOARD

MAIN BOARD

(COMPONENT SIDE VIEW)



(PATTERN SIDE VIEW)



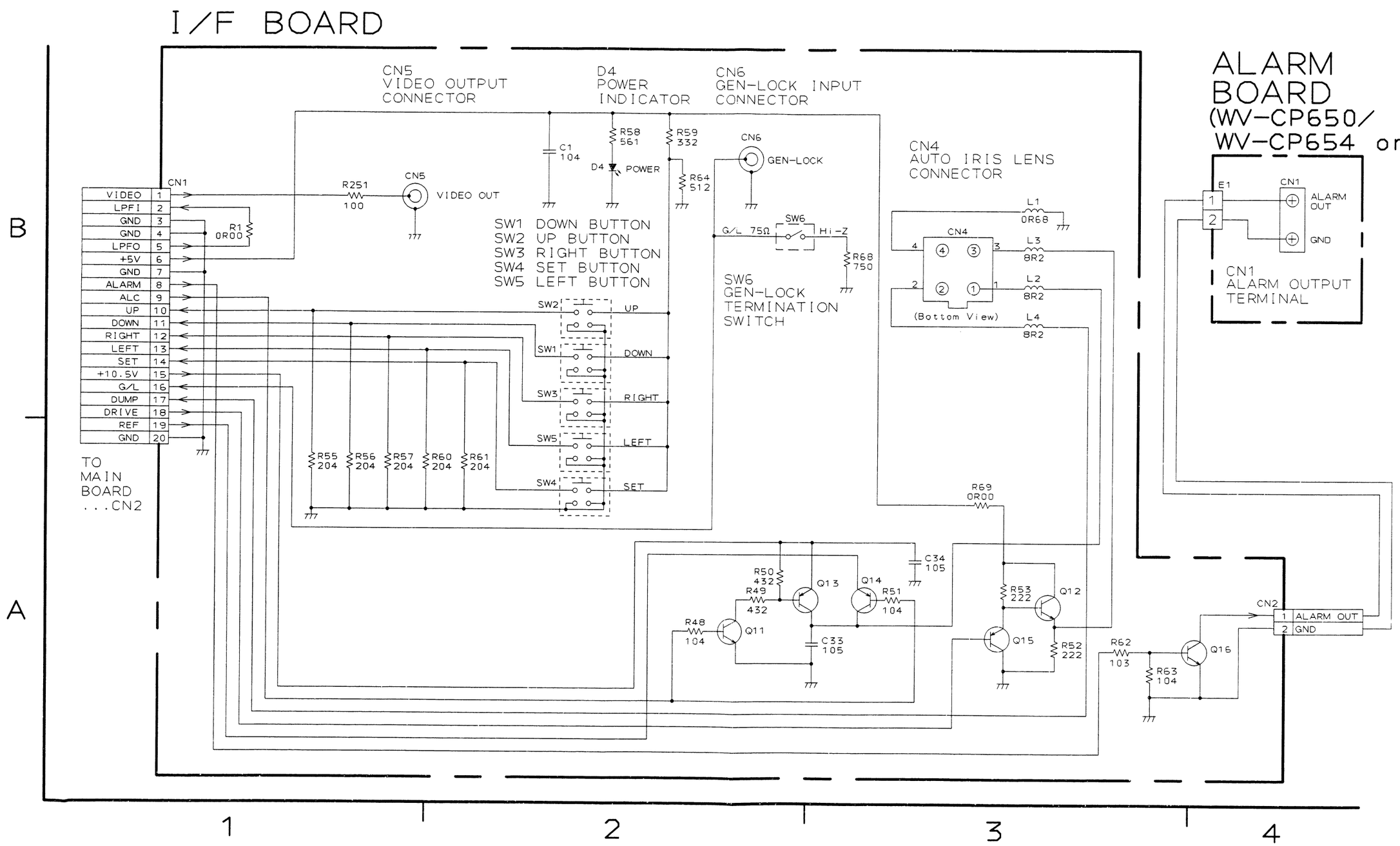
COMPONENT SIDE	INTERMEDIATE PATTERN	PATTERN SIDE	INTERMEDIATE PATTERN
INTERMEDIATE PATTERN	INTERMEDIATE PATTERN	INTERMEDIATE PATTERN	INTERMEDIATE PATTERN

<Index>

MAIN BOARD

IC1	A5	IC21	B2	Q18	C2
IC2	B6	IC22	B2	D3	B2
IC3	B2	IC23	B6	D5	B2
IC4	B6	IC24	B6	D6	B2
IC6	B5	IC25	B6	D8	A2
IC7	B5	IC26	B6	D9	B2
IC8	B3	IC27	B5	D17	C6
IC9	B5	IC29	A2	D18	C6
IC11	B5	Q1	A2	D19	B6
IC12	B5	Q2	B2	D20	C6
IC13	A6	Q3	B3	D21	C6
IC15	B2	Q4	B3	D22	C6
IC17	B2	Q13	C6	D23	C6
IC18	B2	Q14	C6		
IC19	B2	Q15	C6		
IC20	B2	Q17	C2		

SCHEMATIC DIAGRAM OF I/F BOARD/ALARM BOARD (WV-CP650/WV-CP654)



<Index>

I/F BOARD	
Q11	A2
Q12	A3
Q13	A3
Q14	A3
Q15	A3
Q16	A4
D4	B2

Note: **The value indicated in the schematic diagram should be read as follows:**

□ □ □
- Multiplier (0 - 5)
- 2nd. Significant Digit (0 - 9)
- 1st. Siginificant Digit (1 - 9)

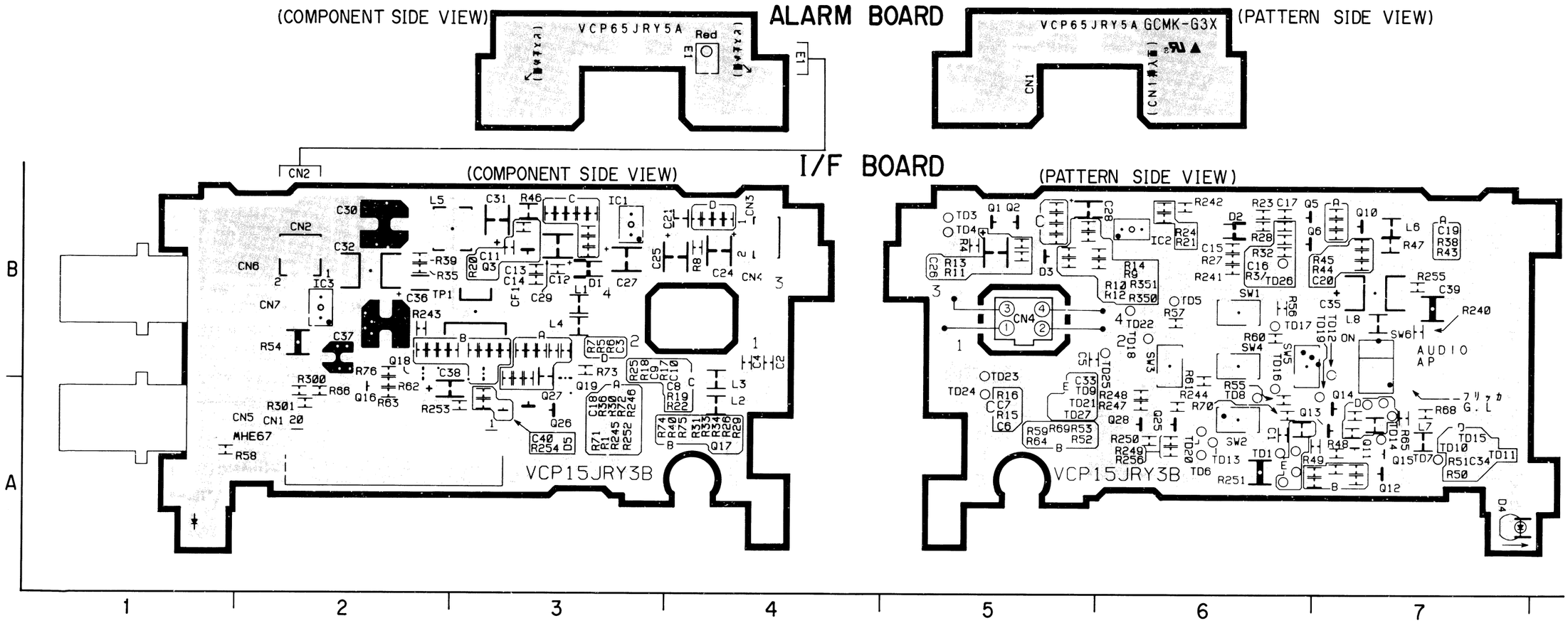
<Example>

For Resistor:
- 330 → 33 x 10^0 = 33 Ω
- 561 → 56 x 10^1 = 560 Ω
- 123 → 12 x 10^3 = 12k Ω
- 0R00 = 0 Ω

For Capacitor:
- 820 → 82 x 10^0 = 82 pF
- 102 → 10 x 10^2 = 1000 pF = 0.001 µF
- 104 → 10 x 10^4 = 100000 pF = 0.1 µF

The suffix attached to capacitance indicates a type of capacitor.

CONDUCTOR VIEW OF I/F BOARD/ALARM BOARD (WV-CP650/WV-CP654)



<Voltage>

I/F BOARD

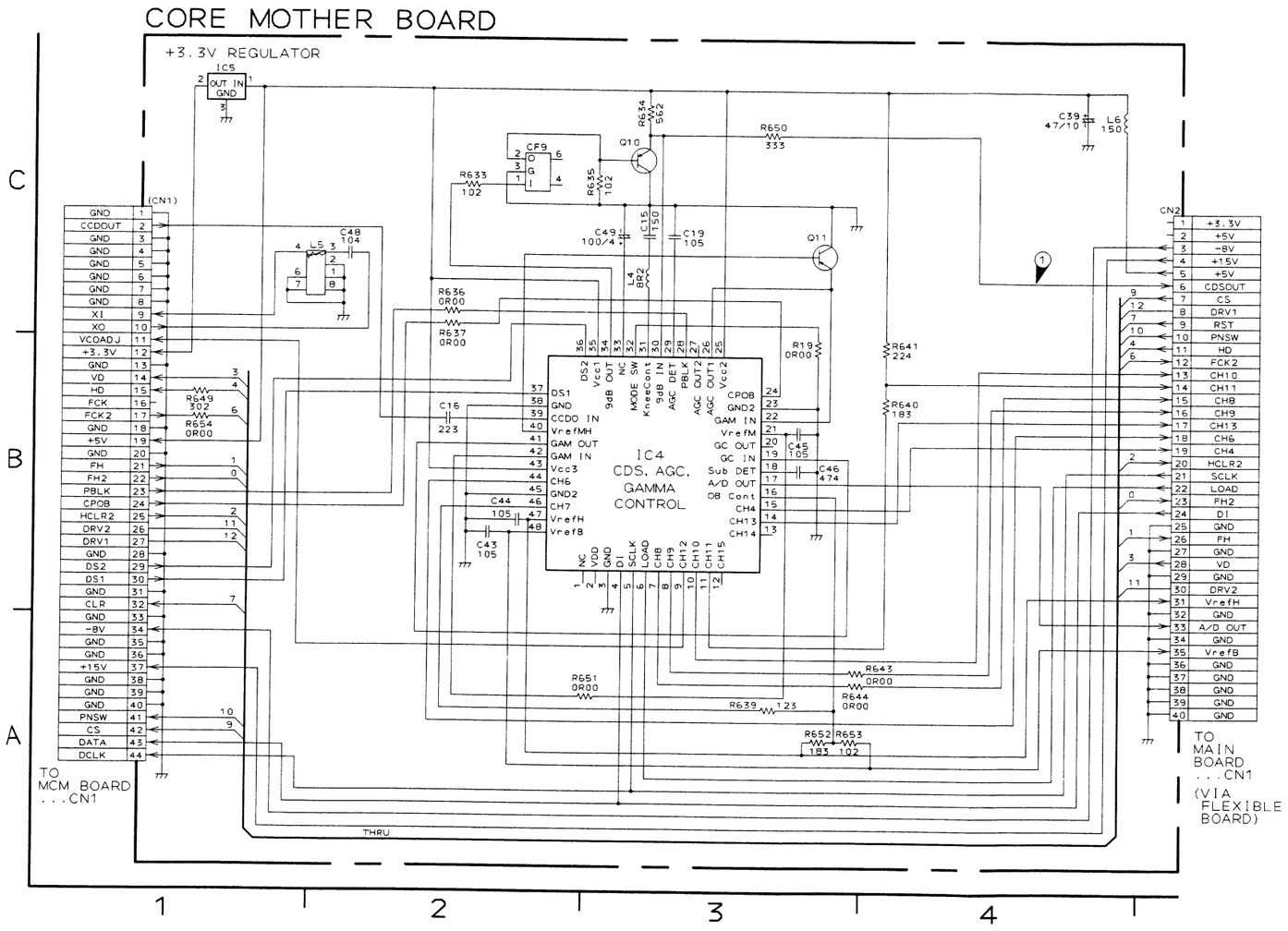
	B	C	E
Q 11	0	10.3	0
12	4.7	5.1	4.0
13	10.3	2.0	10.3
14	1.5	2.0	2.0
15	2.2	0	2.6
16	0	0.9	0

<Index>

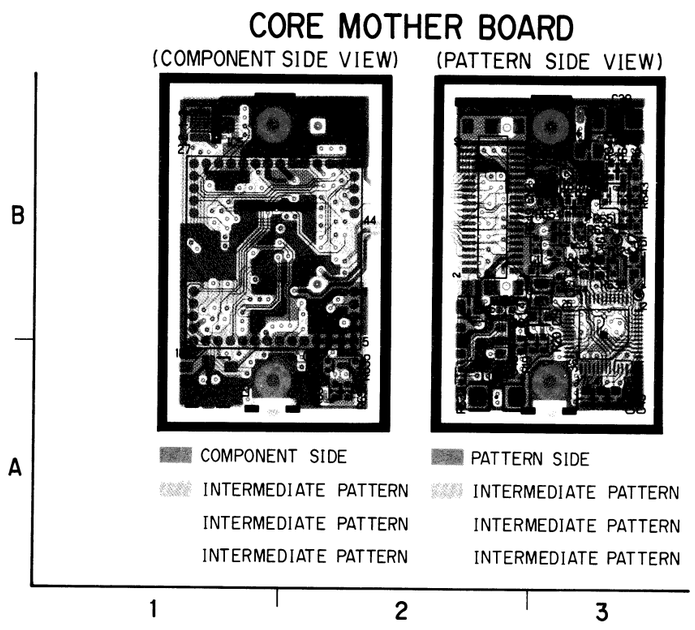
I/F BOARD

Q11	A7
Q12	A7
Q13	A7
Q14	A7
Q15	A7
Q16	A2
D4	A7

SCHEMATIC DIAGRAM OF CORE MOTHER BOARD



CONDUCTOR VIEW OF CORE MOTHER BOARD



<Index>

CORE MOTHER BOARD

IC4 A3
IC5 B1
Q10 A2
Q11 B3

<Index>

CORE MOTHER BOARD

iC4 B3
IC5 C1
Q10 C3
Q11 C3

Note: The value indicated in the schematic diagram should be read as follows:

□ □ □
- Multiplier (0 - 5)
- 2nd. Significant Digit (0 - 9)
- 1st. Siginificant Digit (1 - 9)

<Example>

For Resistor:

330 → 33 x 10^0 = 33 Ω
561 → 56 x 10^1 = 560 Ω
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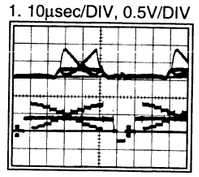
104 → 10 x 10^4 = 100000 pF = 0.1 µF

The suffix attached to capacitance indicates a type of capacitor.

<Waveform> CORE MOTHER BOARD

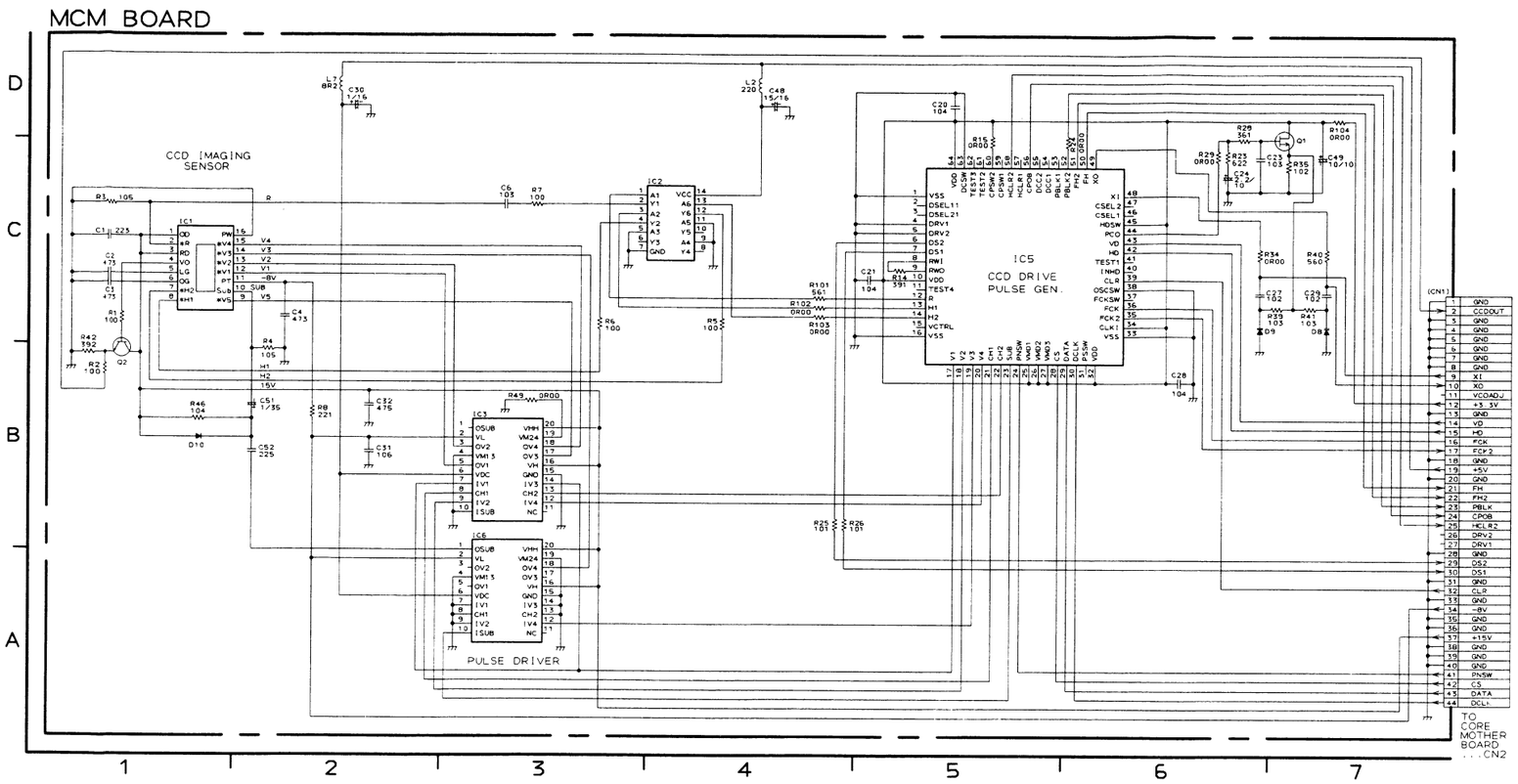
1. 10µsec/DIV, 0.5V/DIV



CDSOUT

VIDEO OUT

SCHEMATIC DIAGRAM OF MCM BOARD



<Index>

MCM BOARD

IC1	C1
IC2	C4
IC3	B3
IC5	C5
IC6	B3
Q1	C7
Q2	B1
D8	C7
D9	C6
D10	B1

Note: The value indicated in the schematic diagram should be read as follows:

□ □ □
- Multiplier (0 - 5)
- 2nd. Significant Digit (0 - 9)
- 1st. Siginificant Digit (1 - 9)

<Example>

For Resistor:

330 → 33 x 10^0 = 33 Ω
561 → 56 x 10^1 = 560 Ω
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0R00 = 0 Ω

For Capacitor:

820 → 82 x 10^0 = 82 pF
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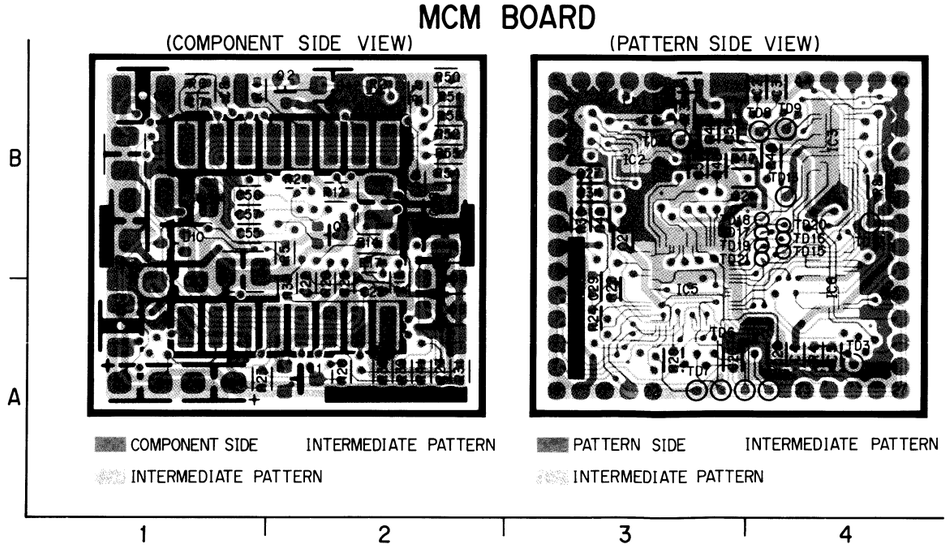
The suffix attached to capacitance indicates a type of capacitor.

CONDUCTOR VIEW OF MCM BOARD

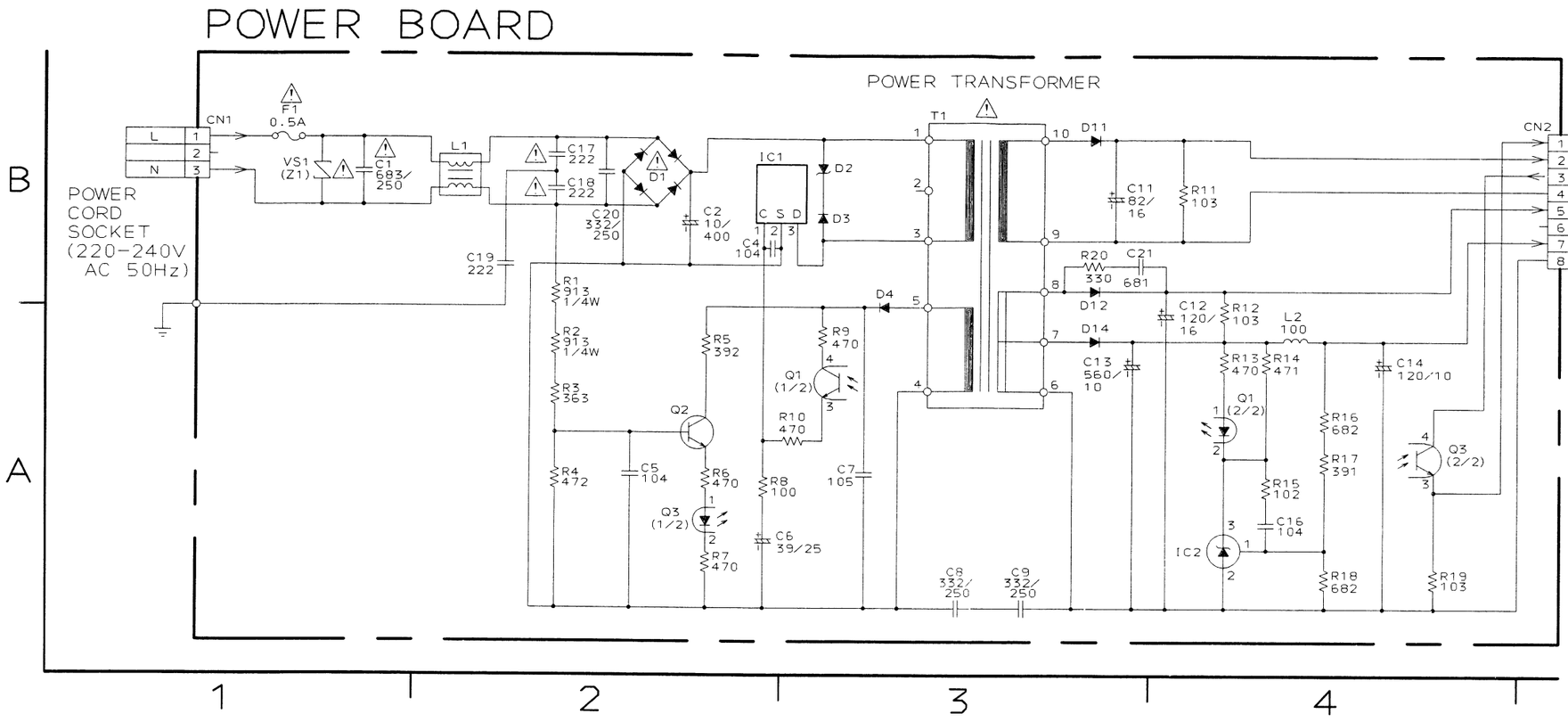


<Index>

MCM BOARD

IC1	B1
IC2	B3
IC3	B4
IC5	A3
IC6	A4
Q1	A2
Q2	B2
D8	A2
D9	A2
D10	B1

SCHEMATIC DIAGRAM OF POWER BOARD (WV-CP450/WV-CP650)



<Index>

POWER BOARD

IC1	B3
IC2	A4
Q1	A3, A4
Q2	A2
Q3	A2, A4
D1	B2
D2	B3
D3	B3
D4	B3
D11	B3
D12	B3
D14	A3

Note: **The value indicated in the schematic diagram should be read as follows:**

□ □ □
- Multiplier (0 - 5)
- 2nd. Significant Digit (0 - 9)
- 1st. Siginificant Digit (1 - 9)

<Example>

For Resistor:
- 330 → 33 x 10^{0} = 33 Ω
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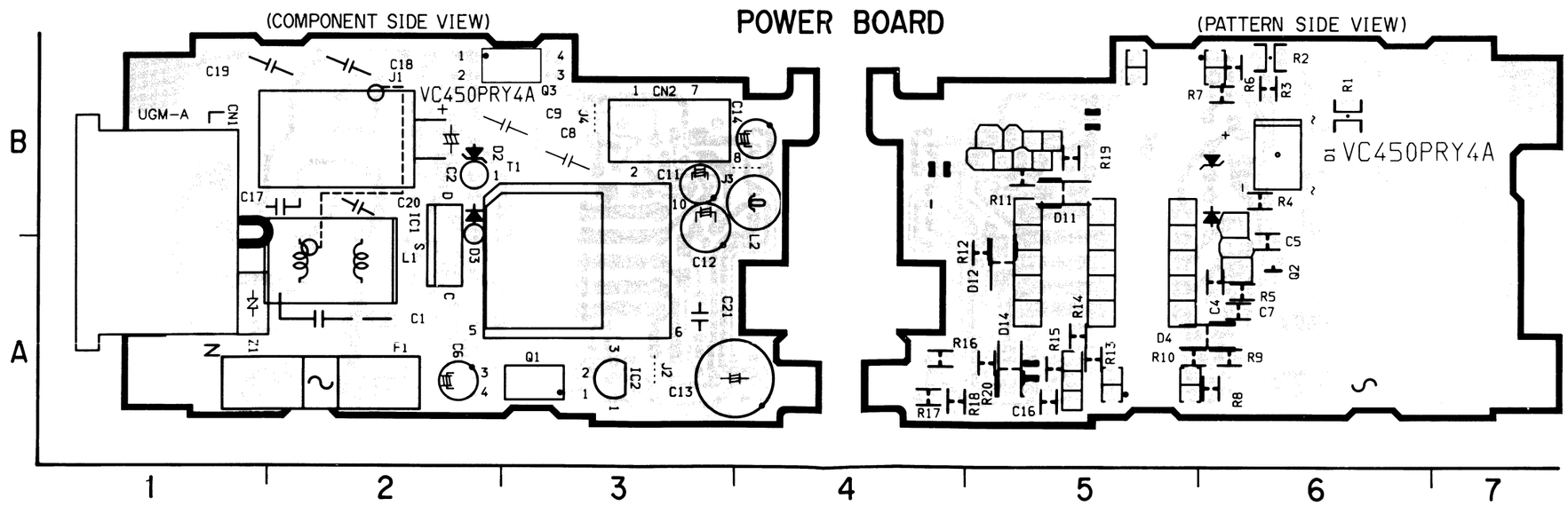
- 102 → 10 x 10^{2} = 1000 pF = 0.001 μF
- 104 → 10 x 10^{4} = 100000 pF = 0.1 μF

The suffix attached to capacitance indicates a type of capacitor.

Important safety notice
Components identified by " ⚠ " mark have special characteristics for safety.
When replacing any of these components, use only manufacturer's specified parts.

CONDUCTOR VIEW OF POWER BOARD (WV-CP450/WV-CP650)

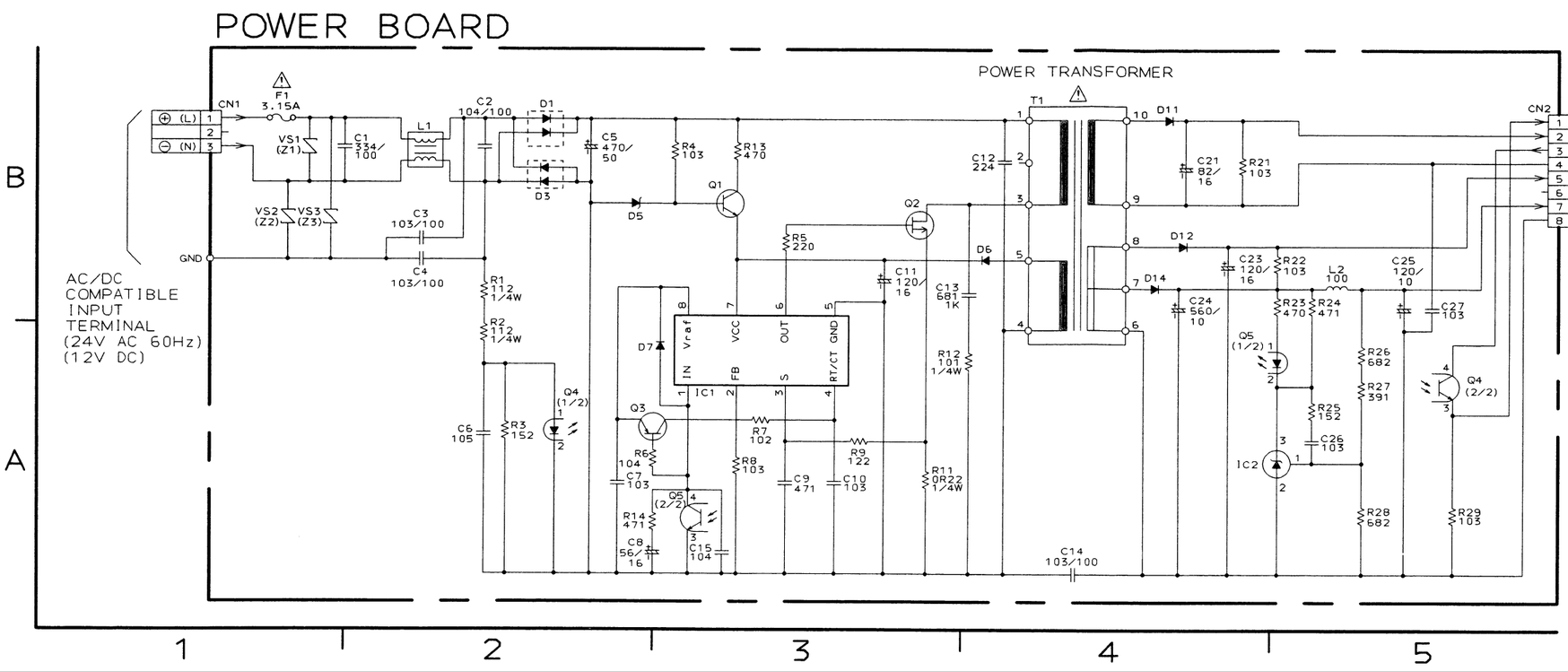


<Index>

POWER BOARD

IC1	B2
IC2	A3
Q1	A3
Q2	A6
Q3	B3
D1	B6
D2	B2
D3	B3
D4	A5
D11	B5
D12	A5
D14	A5

SCHEMATIC DIAGRAM OF POWER BOARD (WV-CP454/WV-CP654)

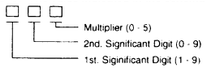


<Index>

POWER BOARD

IC1	A3
IC2	A4
Q1	B3
Q2	B3
Q3	A2
Q4	A2, A5
Q5	A3, A4
D1	B2
D3	B2
D5	B2
D6	A4
D7	A3
D11	A4
IC12	A4
IC14	A4

Note: **The value indicated in the schematic diagram should be read as follows:**



<Example>

For Resistor:

330 ⟶ 33 x 10^0 = 33 Ω
561 ⟶ 56 x 10^1 = 560 Ω
123 ⟶ 12 x 10^1 = 12k Ω
0R00 = 0 Ω

For Capacitor:

820 ⟶ 82 x 10^0 = 82 pF
102 ⟶ 10 x 10^2 = 1000 pF = 0.001 µF
104 ⟶ 10 x 10^4 = 100000 pF = 0.1 µF

The suffix attached to capacitance indicates a type of capacitor.

Important safety notice

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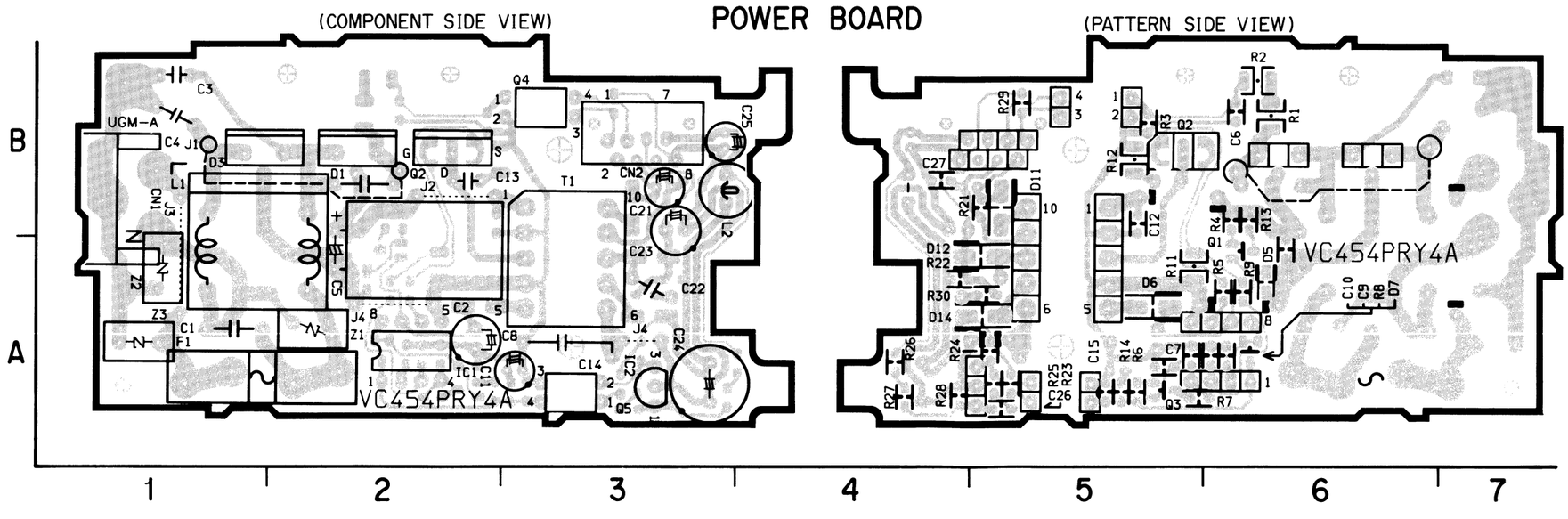
CONDUCTOR VIEW OF POWER BOARD (WV-CP454/WV-CP654)

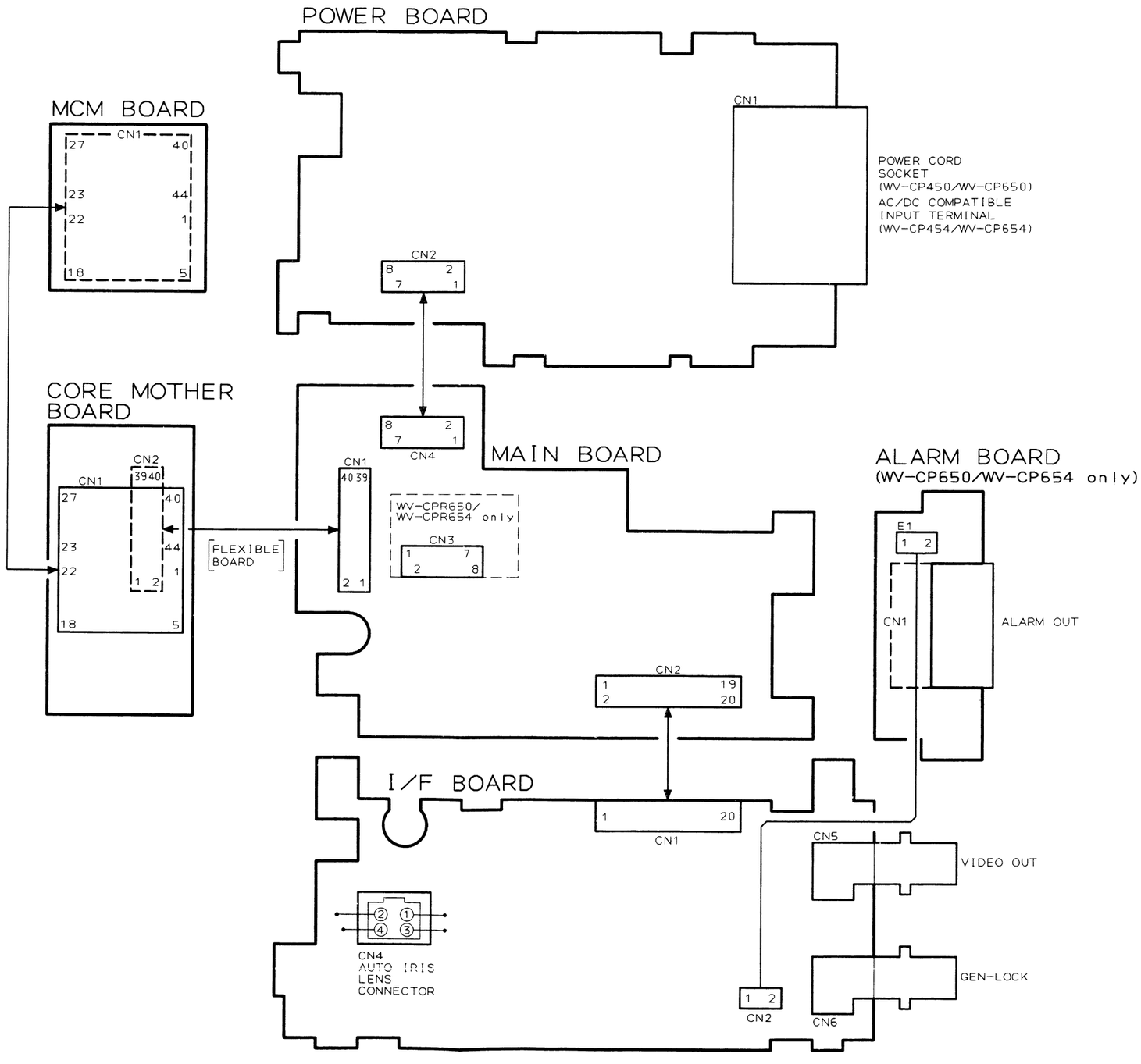


<Index>

POWER BOARD

IC1	A2
IC2	A3
Q1	A6
Q2	B2
Q3	A5
Q4	B3
Q5	A3
D1	B2
D3	B1
D5	A6
D6	A5
D7	A6
D11	B5
IC12	A4
IC14	A4

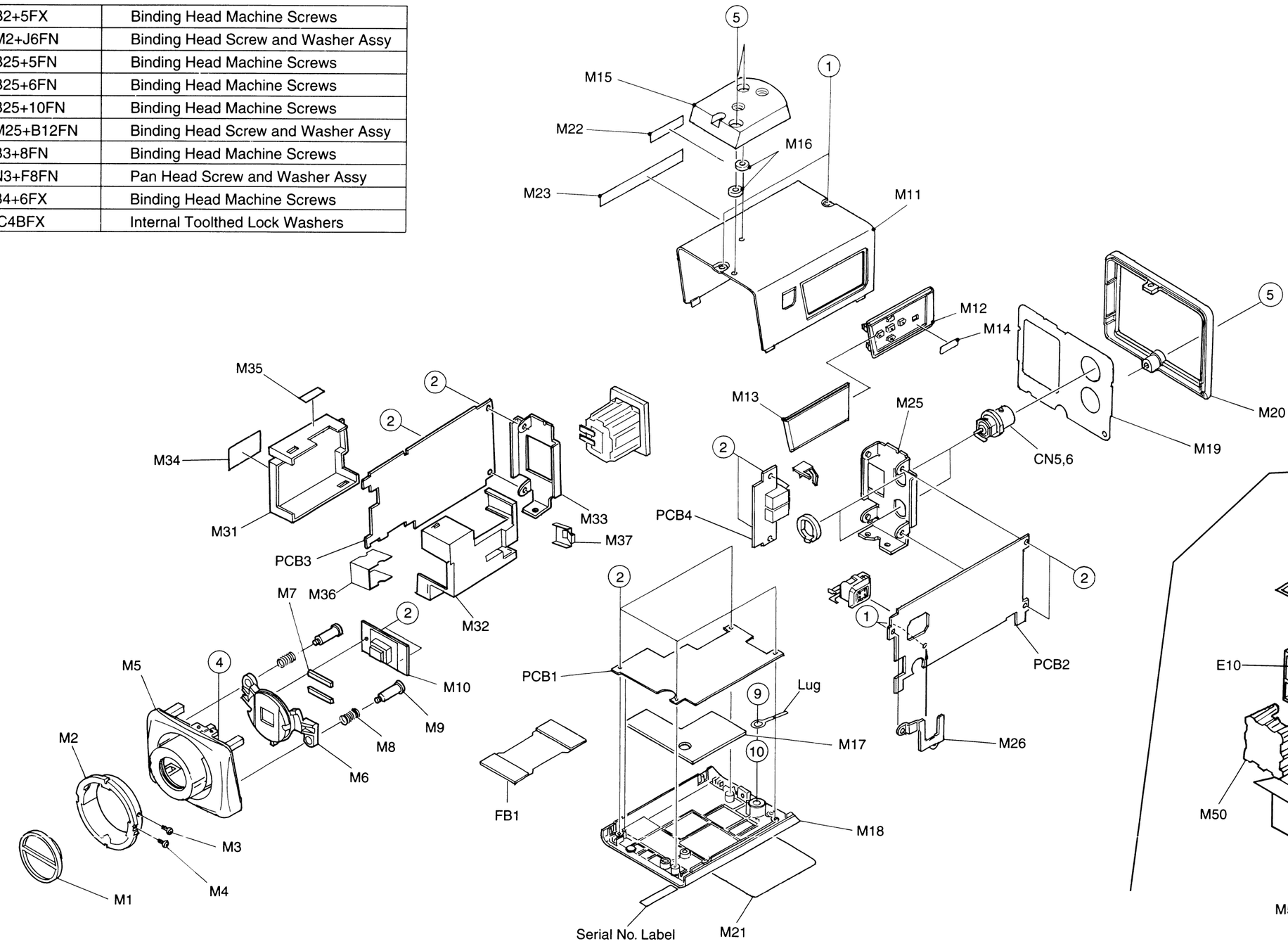
WIRING DIAGRAM



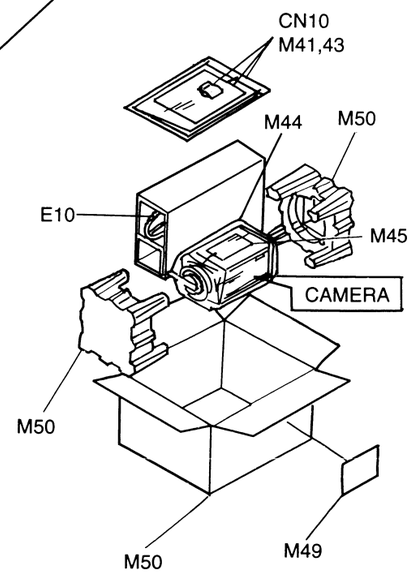
EXPLODED VIEW FOR WV-CP450 / WV-CP650

○Number's show screws and Washers.

①	XSB2+5FX	Binding Head Machine Screws
②	XYM2+J6FN	Binding Head Screw and Washer Assy
③	XSB25+5FN	Binding Head Machine Screws
④	XSB25+6FN	Binding Head Machine Screws
⑤	XSB25+10FN	Binding Head Machine Screws
⑥	XYM25+B12FN	Binding Head Screw and Washer Assy
⑦	XSB3+8FN	Binding Head Machine Screws
⑧	XYN3+F8FN	Pan Head Screw and Washer Assy
⑨	XSB4+6FX	Binding Head Machine Screws
⑩	XWC4BFX	Internal Toolthed Lock Washers



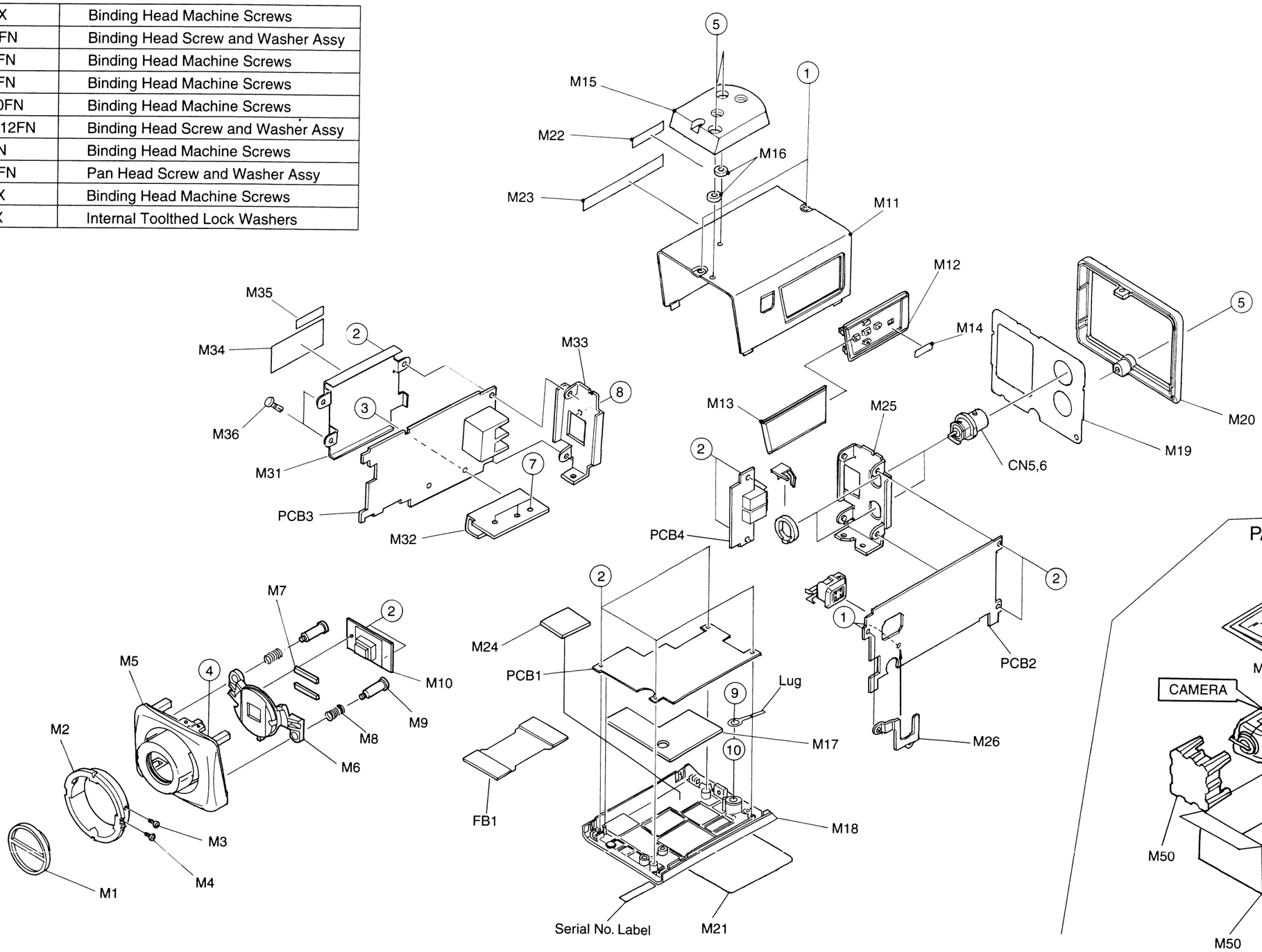
PACKAGING

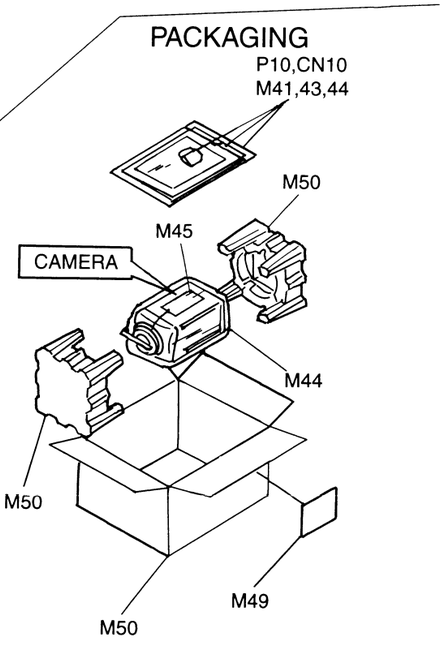


EXPLODED VIEW FOR WV-CP454 / WV-CP654

○Number's show screws and Washers.

①	XSB2+5FX	Binding Head Machine Screws
②	XYM2+J6FN	Binding Head Screw and Washer Assy
③	XSB25+5FN	Binding Head Machine Screws
④	XSB25+6FN	Binding Head Machine Screws
⑤	XSB25+10FN	Binding Head Machine Screws
⑥	XYM25+B12FN	Binding Head Screw and Washer Assy
⑦	XSB3+8FN	Binding Head Machine Screws
⑧	XYN3+F8FN	Pan Head Screw and Washer Assy
⑨	XSB4+6FX	Binding Head Machine Screws
⑩	XWC4BFX	Internal Toolthed Lock Washers





REPLACEMENT PARTS LIST

Important Notice

1. Components identified by " ⚠ " mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
2. RTL : Retention Time Limited,

REF.NO.	PART NO.	DESCRIPTION
MISCELLANEOUS		
FB1	YWVCP15JKZ1A	Flexible Board
M1	YWBC-2B	Body Cap
M2	YWV3FA0178A3	Ring
M3	YWV1EA0128A4	Special Screw
M4	YWV1EB0127A4	FB Lock Screw
M5	YWV5BA1017A2	Front Escutcheon
M6	YWV6FA1021A3	Bracket
M7	YWV2FA1133A4	Cushion
M8	YWV4JA1082A4	Spring
M9	YWV2JA1026A4	Brace
M10	YWV0EA1166AN	Head Optical Assy for WV-CP450/BG,WV-CP454E
	YWV0EA1170AN	Head Optical Assy for WV-CP650//BG,WV-CP654E
M11	YWV5EA2256A2	Upper Cover
M12	YWV9AA2418A3	Side Switch Assy
M13	YWV5WA2319A3	Side Panel for WV-CP450/BG
	YWV5WB2319A3	Side Panel for WV-CP454E
	YWV5WC2319A3	Side Panel for WV-CP650/BG
	YWV5WD2319A3	Side Panel for WV-CP654E
M14	YWV7SA3618A4	Dip Switch Label
M15	YWV2TF0333A3	Mounting Bracket
M16	YWV1KA0128A4	Washer
M17	YWV2FA1119A4	Cushion
M18	YWV2KB1163A2	Bottom Chassi
M19	YWV5WC2316A4	Rear Panel for WV-CP450/BG
	YWV5WA2326A4	Rear Panel for WV-CP454E
	YWV5WC2320A4	Rear Panel for WV-CP650/BG
	YWV5WA2327A4	Rear Panel for WV-CP654E
M20	YWV5BA1018A3	Rear Escutcheon
M21	YWV7QA4699A4	Main Label for WV-CP450/B
	YWV7QA4700A4	Main Label for WV-CP450/G
	YWV7QA4704A4	Main Label for WV-CP454E
	YWV7QA4708A4	Main Label for WV-CP650/B
	YWV7QA4709A4	Main Label for WV-CP650/G
	YWV7QA4712A4	Main Label for WV-CP654E
M22	YWV5DA1111A4	Ornament
M23	YWV7SA3616A4	Side Label
M24	YWV2FA1120A4	Cushion for WV-CP454E
M27	YFV2NA0084A4	Spacer
M28	YWV2PA0615A4	Insulator Sheet

REF.NO.	PART NO.	DESCRIPTION
MAIN BOARD for WV-CP450/BG,WV-CP454E		
PCB1 (RTL)	YWVCP45EKC1A	Printed Circuit Board Assy
IC1	TMP93PS40DF	IC
IC2	MN13821	IC
IC3	YWBR9040FT1	IC
IC4	MN67353	IC
IC7	MN673521	IC
IC9	YWD6462GS905	IC
IC11,12	YWTC7S04F	IC
IC13	AN9DE01F	IC
IC15	YWTDA8766GCS	IC
IC17	YWTC7S32F	IC
IC19	YWTC7S32F	IC
IC20	YWTC7S04FUL	IC
IC21,22	YWTC7S08FUL	IC
IC23	YWTC7S04FUL	IC
IC24	TC7SH00FUL	IC
IC25	YWTC7W74F	IC
IC26	XC62AP4702MR	IC
Q1-4	2SK106945	FET
Q13	2SD1820-QRS	Transistor
Q14	2SB1219-QRS	Transistor
Q15	2SD874A-RS	Transistor
Q17	2SC4617	Transistor
Q18	2SA1774	Transistor
D3	YWHVU350TRF	Diode
D5,6	YWHVU359TRF	Diode
D8	HVU350TRF	Diode
D9	YWDA121	Diode
D17	YWDA227TL	Diode
D18	MA8150MTX	Diode
D19	MA8100HTX	Diode
D20-22	MA726	Diode
D23	MA8039HTX	Diode
TH193	L311F202J402	Thermistor
R1-3	ERJ3GEYJ101	Carbon 100ohms 1/16W
R5	ERJ3GEYJ105	Carbon 1Mohms 1/16W
R8	ERJ3GEYJ103	Carbon 10Kohms 1/16W
R9	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R10	ERJ3GEYJ102	Carbon 1Kohms 1/16W
R13	ERJ3GEYJ103	Carbon 10Kohms 1/16W
R14	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R15	ERJ3GEYJ103	Carbon 10Kohms 1/16W
R17	ERJ3GEYJ103	Carbon 10Kohms 1/16W
R19	ERJ3GEYJ621	Carbon 620ohms 1/16W
R22	ERJ3GEYJ304	Carbon 300K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION
R23	ERJ3GEYJ201	Carbon 200 ohms 1/16W
R25	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R26	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R29	ERJ3GEYJ105	Carbon 1M ohms 1/16W
R32	ERJ3GEYJ104	Carbon 100K ohms 1/16W
R33	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R34	ERJ3GEYJ332	Carbon 3.3K ohms 1/16W
R35	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R36	ERJ3GEYJ104	Carbon 100K ohms 1/16W
R37	ERJ3GEYJ202	Carbon 2K ohms 1/16W
R38	ERJ3GEYJ104	Carbon 100K ohms 1/16W
R39	ERJ3GEYJ105	Carbon 1M ohms 1/16W
R42	ERJ3GEYJ621	Carbon 620 ohms 1/16W
R43	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R44	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R47	ERJ3GEYJ242	Carbon 2.4K ohms 1/16W
R50	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R53	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R54	ERJ3GEYJ104	Carbon 100K ohms 1/4W
R55	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R56	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R57	ERJ3GEYJ101	Carbon 100 ohms 1/16W
R58	ERJ3GEYJ302	Carbon 3K ohms 1/16W
R60	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R63	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R64	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R65	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R66	ERJ3GEYJ514	Carbon 510K ohms 1/16W
R67	ERJ3GEYJ222	Carbon 2.2K ohms 1/16W
R68	ERJ3GEYJ474	Carbon 470K ohms 1/16W
R69	ERJ3GEYJ134	Carbon 130K ohms 1/16W
R70	ERJ3GEYJ152	Carbon 1.5K ohms 1/16W
R71	ERJ3GEYJ752	Carbon 7.5K ohms 1/16W
R72	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R76	ERJ3GEYJ473	Carbon 47K ohms 1/16W
R79	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R80	ERJ3GEYJ122	Carbon 1.2K ohms 1/16W
R84	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R87	ERJ3RHD103V	Metal 10K ohms 1/16W
R88	ERJ3RHD202V	Metal 2K ohms 1/16W
R93	ERJ3GEYJ222	Carbon 2.2K ohms 1/16W
R94	ERJ3GEYJ751	Carbon 750 ohms 1/16W
R100	ERJ3GEYJ303	Carbon 30K ohms 1/16W
R102	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R103	ERJ3GEYJ153	Carbon 15K ohms 1/16W
R104	ERJ3GEYJ154	Carbon 150K ohms 1/16W
R105	ERJ3GEYJ362	Carbon 3.6K ohms 1/16W
R106	ERJ3GEYJ513	Carbon 51K ohms 1/16W
R108	ERJ3RHD821V	Metal 820 ohms 1/16W
R109	YWR0816P102D	Metal 1K ohms 1/16W
R111	ERJ3GEYJ104	Carbon 100K ohms 1/16W
R113	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R117,118	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R119	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R122	ERJ3GEYJ563	Carbon 56K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION
R123	ERJ3GEYJ512	Carbon 5.1K ohms 1/16W
R125	ERJ3GEYJ391	Carbon 390 ohms 1/16W
R126,127	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R132	ERJ3GEYJ332	Carbon 3.3K ohms 1/16W
R133	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R136	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R139	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R148	ERJ14YJ620	Carbon 62 ohms 1/4W
R149	ERJ3GEYJ162	Carbon 1.6K ohms 1/16W
R150	ERJ3GEYJ201	Carbon 200 ohms 1/16W
R151	ERJ3GEYJ391	Carbon 390 ohms 1/16W
R153	ERJ3GEYJ622	Carbon 6.2K ohms 1/16W
R154,155	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R156	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R157	ERJ3GEYJ105	Carbon 1M ohms 1/16W
R158	ERJ6GEYJ161V	Carbon 160 ohms 1/16W
R159	ERJ6GEYJ201	Carbon 200 ohms 1/10W
R161	ERJ3GEYJ101	Carbon 100 ohms 1/16W
R162	ERJ6GEYJ120	Carbon 12 ohms 1/10W
R163	ERJ3RHD203V	Metal 20K ohms 1/16W
R166,167	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R170	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R172	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R173	ERJ3GEYJ131	Carbon 130 ohms 1/16W
R178	ERJ3GEYJ912	Carbon 9.1K ohms 1/16W
R183,184	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R185	ERJ3GEYJ302	Carbon 3K ohms 1/16W
R186	ERJ3GEYJ271	Carbon 270 ohms 1/16W
R188	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R189	ERJ3GEYJ561	Carbon 560 ohms 1/16W
R190	ERJ3GEYJ223	Carbon 22K ohms 1/16W
R191	ERJ3GEYJ102	Carbon 1K ohms 1/16W
R192	ERJ3GEYJ164	Carbon 160K ohms 1/16W
R194	ERJ14YJ101	Carbon 100 ohms 1/4W
R300	ERJ8GCS0R00	Carbon 0 ohms 1/10W
R400	ERDS2TJ474	Carbon 470K ohms 1/4W
C1	YW5F104Z2VB	Ceramic 0.1 µF
C3	YW5F104Z2VB	Ceramic 0.1 µF
C8,9	YW5F104Z2VB	Ceramic 0.1 µF
C13-17	YW5F104Z2VB	Ceramic 0.1 µF
C19	YW5CH270J5VB	Ceramic 27 pF
C21	YW5CH270J5VB	Ceramic 27 pF
C24	YW5F104Z2VB	Ceramic 0.1 µF
C26	YW5CH241J5VB	Ceramic 240 pF
C28	YW5X103K5VB	Ceramic 0.01 µF
C30	YW5UJ150J5VB	Ceramic 15 pF 50V
C32	YW5CH241J5VB	Ceramic 240 pF
C33	YW5UJ150J5VB	Ceramic 15 pF 50V
C34	YW5F104Z2VB	Ceramic 0.1 µF
C36	YW5F104Z2VB	Ceramic 0.1 µF
C37	YW5F104Z2VB	Ceramic 0.1 µF
C38	YW5X103K5VB	Ceramic 0.01 µF
C39	YW5F104Z2VB	Ceramic 0.1 µF
C40	YW5X103K5VB	Ceramic 0.01 µF
C41	YW5F104Z2VB	Ceramic 0.1 µF

REF.NO.	PART NO.	DESCRIPTION	
C42	YW5F104Z2VB	Ceramic	0.1 µF
C43	YW5X103K5VB	Ceramic	0.01 µF
C44	YW5X104K1VB	Ceramic	0.1 µF
C46	YW5F104Z2VB	Ceramic	0.1 µF
C47	YW5X104K1VB	Ceramic	0.1 µF
C50	YW5F473Z5VB	Ceramic	0.047 µF
C51	YW5X222K5VB	Ceramic	2200 pF
C52	YW5CH471J5VB	Ceramic	470 pF
C53	YW400105FZ	Ceramic	1 µF
C56	ECST0JY335	Tantalum	3.3 µF 6.3V
C59	ECST1AC476ZR	Tantalum	47 µF 10V
C60	YW32Y106F16T	Ceramic	10 µF
C61	YW426105FZT	Ceramic	1 µF
C62	ECST0JY335	Tantalum	3.3 µF 6.3V
C63	YW426105XK	Ceramic	1 µF
C64	YW426225FZT	Ceramic	2.2 µF
C65	TAJA105M016	Tantalum	1 µF 16V
C70	YW5F104Z2VB	Ceramic	0.1 µF
C72	YW5F104Z2VB	Ceramic	0.1 µF
C74,75	YW5F104Z2VB	Ceramic	0.1 µF
C77-79	YW5F104Z2VB	Ceramic	0.1 µF
C81	YW5X104K1VB	Ceramic	0.1 µF
C82	YW5X103K5VB	Ceramic	0.01 µF
C83	YW5F104Z2VB	Ceramic	0.1 µF
C84	YW5CH101J5VB	Ceramic	100 pF
C85	YW5F104Z2VB	Ceramic	0.1 µF
C86	YW32Y106F16T	Ceramic	10 µF
C88	YW32Y475F25T	Ceramic	4.7 µF
C89	YW426105XK	Ceramic	1 µF
C90	ECST1EY105ZR	Tantalum	1 µF 25V
C92	YW426105FZT	Ceramic	1 µF
C94,95	YW400105FZ	Ceramic	1 µF
C97	ECST1EX475ZR	Tantalum	4.7 µF 25V
C108,109	YW32Y106F16T	Ceramic	10 µF
C110	EEVHB0J220R	Electrolytic	22 µF 6.3V
C111	EEVHB0J101P	Electrolytic	100 µF 6.3V
C112	YW5F104Z2VB	Ceramic	0.1 µF
C114	ECST1AY106ZR	Tantalum	10 µF 10V
C115	YW5X104K1VB	Ceramic	0.1 µF
C116	YW5CH101J5VB	Ceramic	100 pF
C117	YW5CH102J5VB	Ceramic	1000 pF
C118	YW5F683Z2VB	Ceramic	0.068 µF
C119	YW5F104Z2VB	Ceramic	0.1 µF
C120	YW5F224Z1VB	Ceramic	0.22 µF
C121	YW400475FZT	Ceramic	4.7 µF
C123	YW400105FZ	Ceramic	1 µF
C124	YW400105XKT	Ceramic	1 µF
C125	YW5CH510J5VB	Ceramic	51 pF
C126	YW5CH200J5VB	Ceramic	20 pF
C128,129	YW5CH102J5VB	Ceramic	1000 pF
C130,131	YW5F104Z2VB	Ceramic	0.1 µF
L1	EIC4EJ011E	Coil	
L4,10	ELJFC8R2MF	Coil	8.2 µH
L11,12	ELJFC8R2MF	Coil	8.2 µH
L14	ELJFC6R8JF	Coil	6.8 µH

REF.NO.	PART NO.	DESCRIPTION	
L15	ELJFC2R2JF	Coil	2.2 µH
X1	PBRC12R288BR	Crystal Oscillator	
X2	YW32C228R375	Crystal Oscillator	
X3	YW32C217R734	Crystal Oscillator	
CF1	YWNL4532S4R4	Filter	
CN1	YW41793970	40-pin Connector	
CN2	YWTKCF20PG2	20-pin Connector	
CN4	YWTKCF08PG2	8-pin Connector	

MAIN BOARD for WV-CP650/BG,WV-CP654E

PCB1 (RTL)	YWVCP65EKC1A	Printed Circuit Board Assy	
IC1	TMP93PS40DF	IC	
IC2	MN13821	IC	
IC3	YWBR9040FT1	IC	
IC4	MN67353	IC	
IC6	YWUPD97047GC	IC	
IC7	MN673521	IC	
IC8	YWZA4035H	IC	
IC9	YWD6462GS905	IC	
IC11,12	YWTC7S04F	IC	
IC13	AN9DE01F	IC	
IC15	YWTDA8766GCS	IC	
IC17-19	YWTC7S32F	IC	
IC20	YWTC7S04FUL	IC	
IC21,21	YWTC7S08FUL	IC	
IC23	YWTC7S04FUL	IC	
IC24	TC7SH00FUL	IC	
IC25	YWTC7W74F	IC	
IC26	XC62AP4702MR	IC	
Q1-4	2SK106945	FET	
Q13	2SD1820-QRS	Transistor	
Q14	2SB1219-QRS	Transistor	
Q15	2SD874A-RS	Transistor	
Q17	2SC4617	Transistor	
Q18	2SA1774	Transistor	
D3	YWHVU350TRF	Diode	
D5,6	YWHVU359TRF	Diode	
D8	YWHVU350TRF	Diode	
D9	YWDA121	Diode	
D17	YWDA227TL	Diode	
D18	MA8150MTX	Diode	
D19	MA8100HTX	Diode	
D20-22	MA726	Diode	
D23	MA8039HTX	Diode	
TH193	L311F202J402	Thermistor	
R1-3	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R5	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R8	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R9	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R10	ERJ3GEYJ102	Carbon	1K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R12	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R13	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R14	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R15	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R17	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R18	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R19	ERJ3GEYJ621	Carbon	620 ohms 1/16W
R21	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R22	ERJ3GEYJ304	Carbon	300K ohms 1/16W
R23	ERJ3GEYJ201	Carbon	200 ohms 1/16W
R25	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R26	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R29	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R32	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R33	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R34	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R36	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R37	ERJ3GEYJ202	Carbon	2K ohms 1/16W
R38	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R39	ERJ3GEYJ105	Carbon	1M ohms 1/16W
R42	ERJ3GEYJ621	Carbon	620 ohms 1/16W
R43	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R44	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R47	ERJ3GEYJ242	Carbon	2.4K ohms 1/16W
R50	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R53	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R54	ERJ3GEYJ104	Carbon	100K ohms 1/4W
R55	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R56	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R57	ERJ3GEYJ101	Carbon	100 ohms 1/16W
R58	ERJ3GEYJ302	Carbon	3.2K ohms 1/16W
R60	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R63	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R64	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R65	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R66	ERJ3GEYJ514	Carbon	510K ohms 1/16W
R67	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R68	ERJ3GEYJ474	Carbon	470K ohms 1/16W
R69	ERJ3GEYJ134	Carbon	130K ohms 1/16W
R70	ERJ3GEYJ152	Carbon	1.5K ohms 1/16W
R71	ERJ3GEYJ472	Carbon	4.7K ohms 1/16W
R72	ERJ3GEYJ752	Carbon	7.5K ohms 1/16W
R76	ERJ3GEYJ473	Carbon	47K ohms 1/16W
R79	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R80	ERJ3GEYJ122	Carbon	1.2K ohms 1/16W
R84	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R87	ERJ3RHD103V	Metal	10K ohms 1/16W
R88	ERJ3RHD202V	Metal	2K ohms 1/16W
R93	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R94	ERJ3GEYJ751	Carbon	750 ohms 1/16W
R100	ERJ3GEYJ303	Carbon	30K ohms 1/16W
R102	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R103	ERJ3GEYJ153	Carbon	15K ohms 1/16W
R104	ERJ3GEYJ154	Carbon	150K ohms 1/16W
R105	ERJ3GEYJ362	Carbon	3.6K ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	
R106	ERJ3GEYJ513	Carbon	51K ohms 1/16W
R108	ERJ3RHD821V	Metal	820 ohms 1/16W
R109	YWR0816P102D	Metal	1K ohms 1/16W
R111	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R113	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R117	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R118	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R119	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R122	ERJ3GEYJ563	Carbon	56K ohms 1/16W
R123	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R125	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R126,127	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R132	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R133	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R136	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R139	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R148	ERJ14YJ620	Carbon	62 ohms 1/16W
R149	ERJ3GEYJ162	Carbon	1.6K ohms 1/16W
R150	ERJ3GEYJ201	Carbon	200 ohms 1/16W
R151	ERJ3GEYJ391	Carbon	390 ohms 1/16W
R153	ERJ3GEYJ622	Carbon	6.2K ohms 1/16W
R154,155	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R156	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R157	ERJ3GEYJ105	Carbon	1Mohms 1/16W
R158	ERJ6GEYJ161V	Carbon	160ohms 1/16W
R159	ERJ6GEYJ201	Carbon	200ohms 1/10W
R161	ERJ3GEYJ101	Carbon	100ohms 1/16W
R162	ERJ6GEYJ120	Carbon	12 ohms 1/16W
R163	ERJ3RHD203V	Metal	20Kohms 1/16W
R166,167	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R170,171	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R172	ERJ3GEYJ103	Carbon	10Kohms 1/16W
R173	ERJ3GEYJ131	Carbon	130ohms 1/16W
R178	ERJ3GEYJ912	Carbon	9.1K ohms 1/16W
R185	ERJ3GEYJ302	Carbon	3K ohms 1/16W
R186	ERJ3GEYJ271	Carbon	270ohms 1/16W
R188	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R189	ERJ3GEYJ561	Carbon	560ohms 1/16W
R190	ERJ3GEYJ223	Carbon	22Kohms 1/16W
R191	ERJ3GEYJ102	Carbon	1K ohms 1/16W
R192	ERJ3GEYJ164	Carbon	160K ohms 1/16W
R194	ERJ14YJ101	Carbon	100ohms 1/16W
R300	ERJ8GCS0R00	Carbon	0 ohms 1/16W
R400	ERDS2TJ474	Carbon	470K ohms 1/4W
Z1-4	EXBV8V751JV	Block Resistor	
C1-3	YW5F104Z2VB	Ceramic	0.1 µF
C7-11	YW5F104Z2VB	Ceramic	0.1 µF
C13-17	YW5F104Z2VB	Ceramic	0.1 µF
C19	YW5CH270J5VB	Ceramic	240 pF
C21	YW5CH270J5VB	Ceramic	240 pF
C24	YW5F104Z2VB	Ceramic	0.1 µF
C26	YW5CH241J5VB	Ceramic	240 pF
C28	YW5X103K5VB	Ceramic	0.01µF
C30	YW5UJ150J5VB	Ceramic	15 pF 50V
C32	YW5CH241J5VB	Ceramic	240 pF

REF.NO.	PART NO.	DESCRIPTION	
C33	YW5UJ150J5VB	Ceramic	15 pF 50V
C34,36	YW5F104Z2VB	Ceramic	0.1 µF
C37	YW5F104Z2VB	Ceramic	0.1 µF
C38	YW5X103K5VB	Ceramic	0.01 µF
C39	YW5F104Z2VB	Ceramic	0.1 µF
C40	YW5X103K5VB	Ceramic	0.01 µF
C41,42	YW5F104Z2VB	Ceramic	0.1 µF
C43	YW5X103K5VB	Ceramic	0.01 µF
C44	YW5X104K1VB	Ceramic	0.1 µF
C46	YW5F104Z2VB	Ceramic	0.1 µF
C47	YW5X104K1VB	Ceramic	0.1 µF
C50	YW5F473Z5VB	Ceramic	0.047 µF
C51	YW5X222K5VB	Ceramic	2200 pF
C52	YW5CH471J5VB	Ceramic	470 pF
C53	YW400105FZ	Ceramic	1 µF
C56	ECST0JY335	Tantalum	3.3 µF 6.3V
C57	YW32Y106F16T	Ceramic	10 µF
C59	ECST1AC476ZR	Tantalum	47 µF 10V
C60	YW32Y106F16T	Ceramic	10 µF
C61	YW426105FZT	Ceramic	1 µF
C62	ECST0JY335	Tantalum	3.3 µF 6.3V
C63	YW426105XK	Ceramic	1 µF
C64	YW426225FZT	Ceramic	2.2 µF
C65	TAJA105M016R	Tantalum	1 µF 16V
C70,72	YW5F104Z2VB	Ceramic	0.1 µF
C74,75	YW5F104Z2VB	Ceramic	0.1 µF
C77-79	YW5F104Z2VB	Ceramic	0.1 µF
C81	YW5X104K1VB	Ceramic	0.1 µF
C82	YW5X103K5VB	Ceramic	0.01 µF
C83	YW5F104Z2VB	Ceramic	0.1 µF
C84	YW5CH101J5VB	Ceramic	100 pF
C85	YW5F104Z2VB	Ceramic	0.1 µF
C86	YW32Y106F16T	Ceramic	10 µF
C88	YW32Y475F25T	Ceramic	4.7 µF
C89	YW426105XK	Ceramic	1 µF
C90	ECST1EY105ZR	Tantalum	1 µF 25V
C92	YW426105FZT	Ceramic	1 µF
C94,95	YW400105FZ	Ceramic	1 µF
C97	ECST1EX475ZR	Tantalum	4.7 µF 25V
C108,109	YW32Y106F16T	Ceramic	10 µF
C110	EEVHB0J220R	Electrolytic	22 µF 6.3V
C111	EEVHB0J101P	Electrolytic	100 µF 6.3V
C112	YW5F104Z2VB	Ceramic	0.1 µF
C114	ECST1AY106ZR	Tantalum	10 µF 10V
C115	YW5X104K1VB	Ceramic	0.1 µF
C116	YW5CH101J5VB	Ceramic	100 pF
C117	YW5CH102J5VB	Ceramic	1000 pF
C118	YW5F683Z2VB	Ceramic	0.068 µF
C119	YW5F104Z2VB	Ceramic	0.1 µF
C120	YW5F224Z1VB	Ceramic	0.22 µF
C121	YW400475FZT	Ceramic	4.7 µF
C123	YW400105FZ	Ceramic	1 µF
C124	YW400105XKT	Ceramic	1 µF
C125	YW5CH510J5VB	Ceramic	51 pF
C126	YW5CH200J5VB	Ceramic	20 pF
C128,129	YW5CH102J5VB	Ceramic	1000 pF
C130,131	YW5F104Z2VB	Ceramic	0.1 µF
L1	EIC4EJ011E	Coil	
L2,4	ELJFC8R2MF	Coil	8.2 µH
L10-12	ELJFC8R2MF	Coil	8.2 µH
L14	ELJFC6R8JF	Coil	6.8 µH
L15	ELJFC2R2JF	Coil	2.2 µH
X1	PBRC12R288BR	Crystal Oscillator	
X2	YW32C228R375	Crystal Oscillator	
X3	YW32C217R734	Crystal Oscillator	
CF1	YWNL4532S4R4	Filter	
CN1	YW41793970	40-pin Connector	
CN2	YWTKCF20PG2	20-pin Connector	
CN4	YWTKCF08PG2	8-pin Connector	

I / F BOARD for WV-CP450/BG,WV-CP454E

PCB2 (RTL)	YWVCP45JKY3A	Printed Circuit Board Assy	
D4	YWSLC22VR	LED	
Q11	2SC4617	Transistor	
Q12	2SD1819-QRS	Transistor	
Q13,14	2SB1218A-QR	Transistor	
Q15	2SA1774	Transistor	
Q16	2SC4617	Transistor	
R1	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R48	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R49,50	ERJ3GEYJ432	Carbon	4.3K ohms 1/16W
R51	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R52,53	ERJ3GEYJ222	Carbon	2.2K ohms 1/16W
R55-57	ERJ3GEYJ204	Carbon	200K ohms 1/16W
R58	ERJ3GEYJ561	Carbon	560 ohms 1/16W
R59	ERJ3GEYJ332	Carbon	3.3K ohms 1/16W
R60,61	ERJ3GEYJ204	Carbon	200K ohms 1/16W
R62	ERJ3GEYJ103	Carbon	10K ohms 1/16W
R63	ERJ3GEYJ104	Carbon	100K ohms 1/16W
R64	ERJ3GEYJ512	Carbon	5.1K ohms 1/16W
R68	ERJ3GEYJ750	Carbon	75 ohms 1/16W
R69	ERJ3GEY0R00	Carbon	0 ohms 1/16W
R251	ERJ14YJ100	Carbon	10 ohms 1/4W
C1	YW5F104Z2VB	Ceramic	0.1µF
C33,34	YW400105FZ	Ceramic	1 µF
L1	ELJFCR68MF	Coil	0.68 µH
L2-4	ELJFC8R2MF	Coil	8.2µH
SW1-5	YWSKQDPB	Push Switch	
SW6	YWD1S02GE	Dip Switch	
CN1	YWTKCF20PM2	Connector	
CN4	YWM1963	Connector	
CN5,6	YWP2367	Connector	
M25	YWV2KA1171A4	Mounting Chassis for Connector	
M26	YWV2SA4446A4	Mounting Angle	

REF.NO.	PART NO.	DESCRIPTION
I / F BOARD for WV-CP650/BG,WV-CP654E		
PCB2 (RTL)	YWVCP65JKY3A	Printed Circuit Board Assy
Q11	2SC4617	Transistor
Q12	2SD1819-QRS	Transistor
Q13,14	2SB1218A-QR	Transistor
Q15	2SA1774	Transistor
Q16	2SC4617	Transistor
D4	YWSLC22VR	LED
R1	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R48	ERJ3GEYJ104	Carbon 100K ohms 1/16W
R49,50	ERJ3GEYJ432	Carbon 4.3K ohms 1/16W
R51	ERJ3GEYJ104	Carbon 100K ohms 1/16W
R52,53	ERJ3GEYJ222	Carbon 2.2K ohms 1/16W
R55-57	ERJ3GEYJ204	Carbon 200K ohms 1/16W
R58	ERJ3GEYJ561	Carbon 560 ohms 1/16W
R59	ERJ3GEYJ332	Carbon 3.3K ohms 1/16W
R60,61	ERJ3GEYJ204	Carbon 200K ohms 1/16W
R62	ERJ3GEYJ103	Carbon 10K ohms 1/16W
R63	ERJ3GEYJ104	Carbon 100K ohms 1/16W
R64	ERJ3GEYJ512	Carbon 5.1K ohms 1/16W
R68	ERJ3GEYJ750	Carbon 75 ohms 1/16W
R69	ERJ3GEY0R00	Carbon 0 ohms 1/16W
R251	ERJ14YJ100	Carbon 10 ohms 1/4W
C1	YW5F104Z2VB	Ceramic 0.1 µF
C33,34	YW400105FZ	Ceramic 1 µF
L1	ELJFCR68MF	Coil 0.68 µH
L2-4	ELJFC8R2MF	Coil 8.2 µH
SW1-5	YWSKQDPB	Push Switch
SW6	YWD1S02GE	Dip Switch
CN1	YWTKCF20PM2	Connector
CN2	S2BZRSM3ATF	2-pin Connector
CN4	YWM1963	Connector
CN5,6	YWP2367	Connector
M25	YWV2KA1171A4	Mounting Chassis for Connector
M26	YWV2SA4446A4	Mounting Angle
POWER BOARD for WV-CP450/BG,CP650/BG		
PCB3 (RTL)	YWVC450EKY4A	Printed Circuit Board Assy
IC1	MIP160	IC
IC2	YWTA76431S	IC
Q1	YWPC123FY2	IC
Q2	2SC2412KT96	Transistor
Q3	YWPC123FY2	Photo Coupler
D1 ⚠	YWDF06S	Diode
D2	YWP6KE180A	Diode
D3	YWERA34-10	Diode
D4,11	YWSC2012	Diode
D12	YWSC2012	Diode

REF.NO.	PART NO.	DESCRIPTION
D14	YWSC80206L	Diode
VS1 ⚠	YWJ07N471KP	ZNR
R1,2	ERJ14YJ913	Carbon 91K ohms 1/4W
R3	ERJ6GEYJ363	Carbon 36K ohms 1/10W
R4	ERJ6GEYJ472	Carbon 4.7K ohms 1/16W
R5	ERJ6GEYJ392	Carbon 3.9K ohms 1/16W
R6,7	ERJ6GEYJ470	Carbon 47 ohms 1/10W
R8	ERJ6GEYJ100	Carbon 10 ohms 1/10W
R9,10	ERJ6GEYJ470	Carbon 47 ohms 1/10W
R11,12	ERJ6GEYJ103	Carbon 10K ohms 1/10W
R13	ERJ6GEYJ470	Carbon 47 ohms 1/10W
R14	ERJ6GEYJ471	Carbon 470 ohms 1/10W
R15	ERJ6GEYJ102	Carbon 1K ohms 1/10W
R16	ERA6YED682V	Metal 6.8K ohms 1/16W
R17	ERJ6GEYJ391	Carbon 390 ohms 1/10W
R18	ERA6YED682V	Metal 6.8K ohms 1/16W
R19	ERJ6GEYJ103	Carbon 10K ohms 1/10W
R20	ERJ6GEYJ330	Carbon 33 ohms 1/10W
C1 ⚠	YWX75M683VS1	Plastic 0.068 µF
C2	RJ3400V100M	Electrolytic 10 µF
C4,5	YF400104FZT	Ceramic 0.1 µF
C6	YWRJJ1E390E3	Electrolytic 39 µF 25V
C7	YW400105FZ	Ceramic 1 µF
C8,9	ECKDRS332	Ceramic 3300pF
C11	YWRJJ1C820E4	Electrolytic 82 µF 16V
C12	YWRJJ1C121F3	Electrolytic 120 µF 16V
C13	YWRJJ1A561H4	Electrolytic 560 µF 10V
C14	YWRJJ1A121E4	Electrolytic 102 µF 10V
C16	YF400104FZT	Ceramic 0.1 µF
C17-19 ⚠	YW12FY222ML7	Ceramic 2200pF
C20	ECKDRS332	Ceramic 3300pF
C21	YWBM6681KH	Ceramic 680 pF
L1	YWLCCP450E	Coil
L2	YWSL675100	Coil
T1 ⚠	YWPTCP450E	Power Transformer
CN1	YWSC8R	Connector
CN2	YWTKCF08PE3	Connector
F1 ⚠	XBA2C05ET0A	Current Fuse 0.5A 250V
E1,2	S-N5057	Fuse Holder
E3	YW840522	Insulator
E4	YW851040	Insulator
M31	YWV5KA2151A3	Case
M32	YWV6EA1032A3	Lid
M33	YWV2KA1172A4	Mounting Chassis for Connector
M34	YFV7MA0412A4	Fuse Change Label
M35	YWV7MA0451A4	Fuse Rated Label
M36	YWV2PA1122A4	Insulator Paper for Power Transformer
M37	YWV7DA1069A4	Hiet Sink for IPD

POWER BOARD for WV-CP454E/CP654E

REF.NO.	PART NO.	DESCRIPTION	
PCB3 (RTL)	YWVC454EKY4A	Printed Circuit Board Assy	
IC1	UC2843NU	IC	
IC2	YWTA76431S	IC	
Q1	2SC2412KT96	Transistor	
Q2	2SK252001MR	FET	
Q3	2SA1037-QRS	Transistor	
Q4,5	YWPC817X7	Photo Coupler	
VS1-3	ERZV07D680	ZNR	
D1	YWD10SC6M	Diode	
D3	YWD10SC6MR	Diode	
D5	YWUDZ11B	Diode	
D6	YWSC2012	Diode	
D7	DAP202KT7	Diode	
D11,12	YWSC2012	Diode	
D14	YWSC80206L	Diode	
R1,2	ERJ14YJ112	Carbon	1.1K ohms 1/10W
R3	ERJ6GEYJ152	Carbon	1.5K ohms 1/10W
R4	ERJ6GEYJ103	Carbon	10K ohms 1/10W
R5	ERJ6GEYJ220	Carbon	22 ohms 1/10W
R6	ERJ6GEYJ104	Carbon	100K ohms 1/10W
R7	YWR1220P102D	Metal	1K ohms
R8	ERJ6GEYJ103	Carbon	10K ohms 1/10W
R9	ERJ6GEYJ122	Carbon	1.2K ohms 1/10W
R11	ERJ14RQJR22U	Carbon	0.22 ohms 1/4W
R12	ERJ14YJ101	Carbon	100 ohms 1/10W
R13	ERJ6GEYJ470	Carbon	47 ohms 1/10W
R14	ERJ6GEYJ471	Carbon	470 ohms 1/10W
R21,22	ERJ6GEYJ103	Carbon	10K ohms 1/10W
R23	ERJ6GEYJ470	Carbon	47 ohms 1/10W
R24	ERJ6GEYJ471	Carbon	470 ohms 1/10W
R25	ERJ6GEYJ152	Carbon	1.5K ohms 1/10W
R26	ERA6YED682V	Metal	6.8K ohms 1/10W
R27	ERJ6GEYJ391	Carbon	390 ohms 1/10W
R28	ERA6YED682V	Metal	6.8K ohms 1/10W
R29	ERJ6GEYJ103	Carbon	10K ohms 1/10W
C1	ECQV1334JM	Plastic	0.33 µF
C2	ECQV1104JM	Plastic	0.1 µF
C3,4	ECQM1103KZ	Ceramic	0.01 µF
C5	YWRJ350V471	Electrolytic	470 µF 350V
C6	YW400105FZ	Ceramic	1 µF
C7	YF400103XKT	Ceramic	0.01 µF
C8	YWRJJ1C560E3	Electrolytic	56 µF 16V
C9	YF400471CHJT	Ceramic	470 pF
C10	YF400103XKT	Ceramic	0.01 µF
C11	YWRJJ1C121F3	Electrolytic	120 µF 16V
C12	YF400224FZT	Ceramic	0.22 µF
C13	YWBM6681KH	Ceramic	680 pF
C14	ECQM1103KZ	Ceramic	0.01 µF
C15	YF400104FZT	Ceramic	0.1 µF
C21	YWRJJ1C820E4	Electrolytic	82 µF 16V
C23	YWRJJ1C121F3	Electrolytic	120 µF 16V
C24	YWRJJ1A561H4	Electrolytic	560 µF 10V
C25	YWRJJ1A121E4	Electrolytic	120 µF 10V
C26,27	YF400103XKT	Ceramic	0.01 µF
L1	YWLCCP454P	Coil	
L2	YWSL675100	Coil	
T1 ⚠	YWPTCP454P	Power Transformer	
CN1	YWT6944	Connector	
CN2	YWTKCF08PE3	Connector	
F1 ⚠	XBA2C31ET0A	Current Fuse	3.1A 125V
E1,2	S-N5057	Fuse Holder	
E3	YW840522	Insulator	
M31	YWV2PA1121A4	Insulator Cover	
M32	YWV7DA1068B4	Heat Sink	
M33	YWV2KA1173A4	Mounting Angle for Terminal Board	
M34	YFV7MA0412A4	Fuse Change Label	
M35	YWV7MA0455A4	Fuse Rated Label	
M36	YW0920	Tact	

ALARM BOARD for WV-CP650/BG,CP654E

PCB4 (RTL)	YWVCP65JKY5A	Printed Circuit Board Assy
CN1	YWML400A102P	Connector
E1	YWCP650J1	Wire Assy for I/F Board CN2

ACCESSORY PARTS/PACKAGING PARTS

E10 ⚠	YWACP45B	AC Power Cord Assy for WV-CP450/B,CP650/B
⚠	YWACP45G	AC Power Cord Assy for WV-CP450/G,CP650/G
P10	YWBNC117PNI	Plug for WV-CP454E,CP654E
CN10	YWM1943A	ALC Lens Connector
M41	YWV8QA4715AN	Operating Instructions for WV-CP450/BG,CP454E
	YWV8QA4719AN	Operating Instructionsfor WV-CP650/BG,CP654E
M43	YWT050803	Polyethylene Bag
M44	YWT20X35C03	Polyethylene Bag
M45	YWV7SA3645A4	Caution Label
M49	YWV7SA2037A3	Bar Cord Label
M50	YWV9CA3573AN	Packaging Assy for WV-CP450/B
	YWV9CA3574AN	Packaging Assy for WV-CP450/G
	YWV9CA3578AN	Packaging Assy for WV-CP454E
	YWV9CA3582AN	Packaging Assy for WV-CP650/B
	YWV9CA3583AN	Packaging Assy for WV-CP650/G
	YWV9CA3586AN	Packaging Assy for WV-CP654E

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